JANUARY 27, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Why Watch Scrap Prices?

Sensitive barometer hints coming rise in economy ..... *Page 37*

Urge To Merge Still Strong

Congress considers prenotification bill to curb trend ..... *Page 48*

No Trouble with 310 Stainless

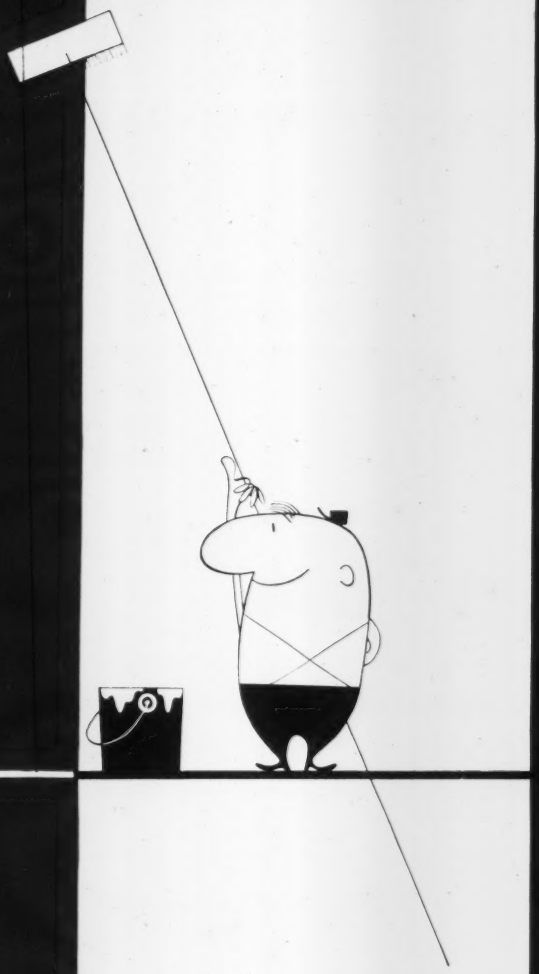
Right stress relief minimizes carbides in processing ..... *Page 72*

How To Weld Copper Alloys

Properties of joint determine which method to use ..... *Page 86*

Imports Worry Steelmakers

Long term trend is up as foreign capacity increases ..... *Page 105*



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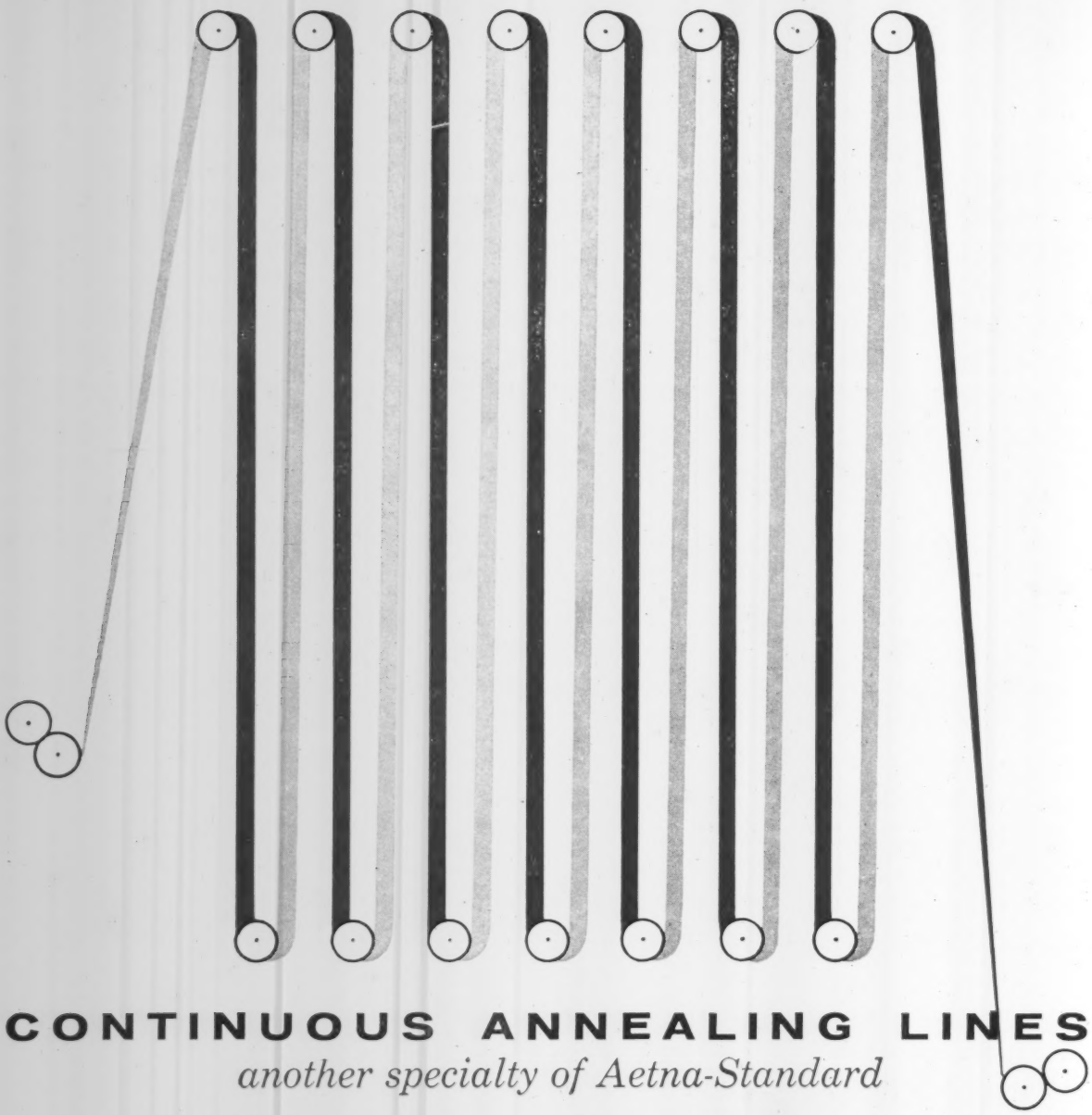

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another specialty of Aetna-Standard

Like Continuous Galvanizing or Tinning, a Continuous Annealing Line requires good designing and rugged equipment.

Aetna has much experience in continuous processing lines, galvanizing, tinning and annealing. In fact, Aetna pioneered in continuous equipment. Two of the most recent high speed Aetna lines incorporate many new ideas and innovations, permitting sure tracking at high speeds of 1,000 feet and more.

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If you want a steel bar like this

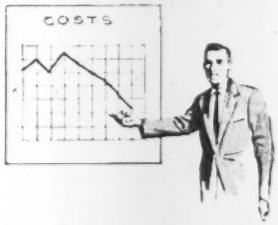
don't buy- and machine away-

Use a Bethlehem special section hot-rolled

to your drawings and specifications.

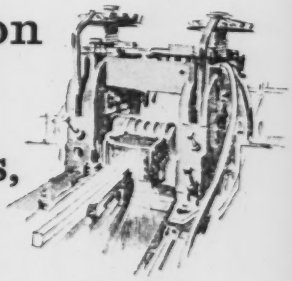
We roll these shapes

and many more. Could a specially rolled

section cut  your machining costs?

Cut production steps? Improve your product?

Ask us for information



about hot-rolled special bar sections,

a Bethlehem specialty since our founding.

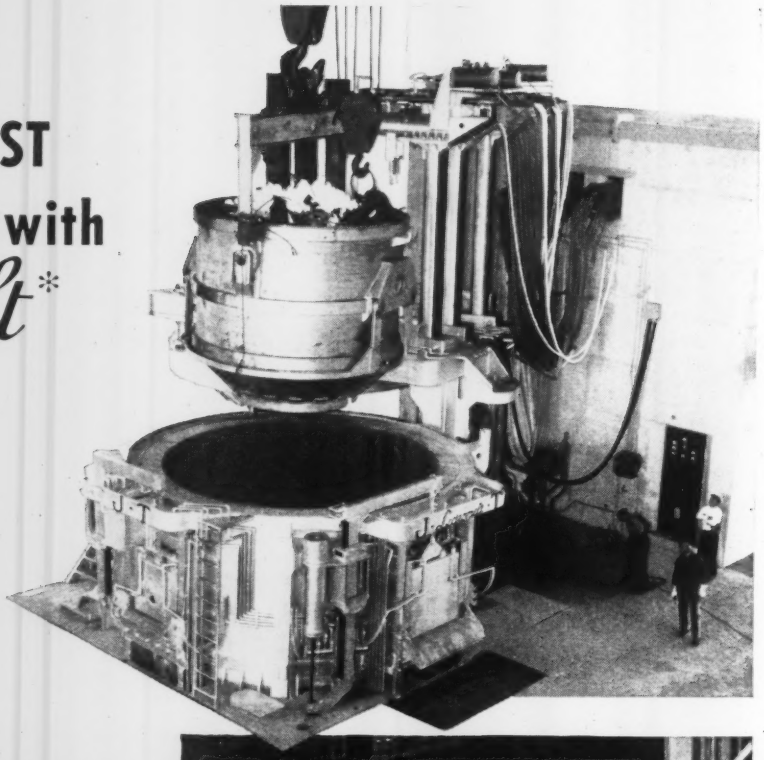
Contact the sales office nearest you.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributors: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

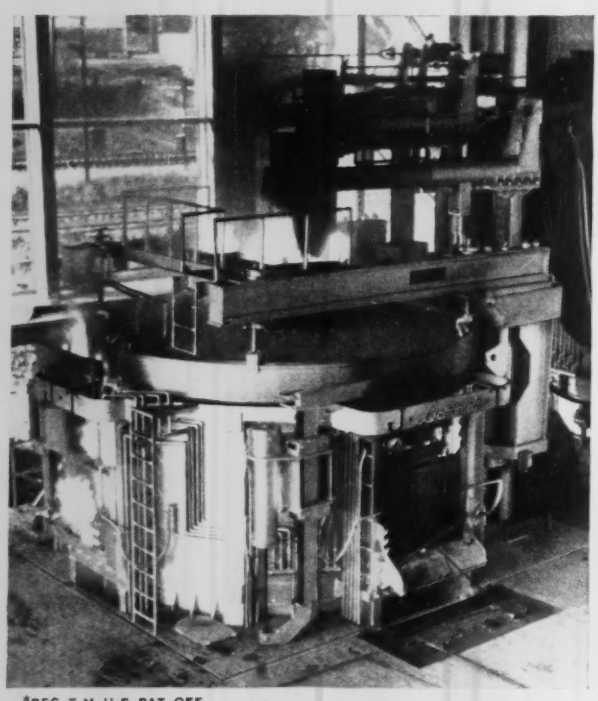
BETHLEHEM STEEL

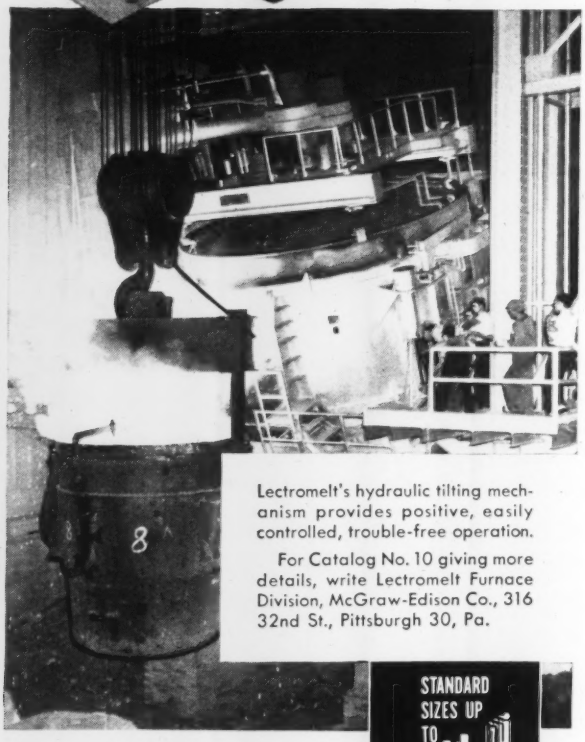
WORK GOES FAST and SMOOTHLY with *Lectromelt** FURNACES



Right: Labor-saving top charging lets a Lectromelt Furnace get to work *fast*.

Below: With a Lectromelt Furnace, you can crowd on the power while holding close control on quality.



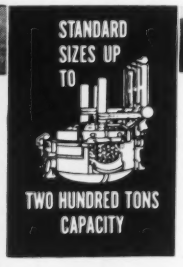


Lectromelt's hydraulic tilting mechanism provides positive, easily controlled, trouble-free operation.

For Catalog No. 10 giving more details, write Lectromelt Furnace Division, McGraw-Edison Co., 316 32nd St., Pittsburgh 30, Pa.

*REG. T.M. U.S. PAT. OFF.

Lectromelt



This advertisement appeared May 23, 1938. It could have been issued, just as appropriately, in 1954 or 1949—or 1932 or 1921 or 1908. The point is that the sun always did rise, after each of those times of recession and depression, some of them panic. And it will rise again.

"The Sun Always Rises"

● You and we have lived through many periods like this. They all follow the same pattern:

People get the idea the world is coming to an end. They stop buying. That makes business worse. Then they're sure it's all over. But miraculously the world doesn't end. A few get sensible again and buy a little. Then with a rush everybody wants to buy, and there's a shortage.

If you are one of the sensible executives who knows perfectly well he's going to continue doing business, now is the time to put your plant on a low-cost basis.

Later, when the rush begins, you'll have to wait for deliveries, you won't have time to make sure you're getting the best buy, you'll have a tight production schedule you may hesitate to interrupt. Then you pay a penalty in higher costs and lower profits for years.

Far-sighted concerns are buying improved, faster, more accurate Warner & Swasey Turret Lathes now, and making a profit on them even on today's reduced production. Tomorrow they'll make enormous profits because their costs are low. And tomorrow you'll have to compete with these concerns—and they'll dictate price because they control costs. Isn't it sound to let us discuss with you today, when you have time, a low-cost basis for your plant, too?

Locomotive journal box being machined on a 4-A.

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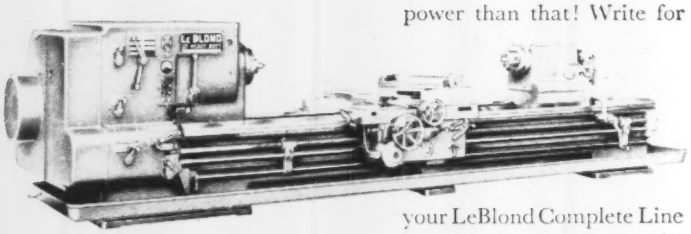
Cleveland

You can turn it better, faster, for less . . . with a Warner & Swasey

THE POWERFULEST LATHES IN EVERY CLASS YOU'LL FIND IN THE LINE OF

This is the 32″ Heavy Duty —pride of the LeBlond Line. Able to push ceramics and carbides to their limits. 36 speeds at 60 HP—and engineered from power unit to cutting tool for far more power than that! Write for



your LeBlond Complete Line Catalog No. C-58G.

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THE R. K. LeBLOND MACHINE TOOL CO. CINCINNATI 8, OHIO

World's Largest Builder of A Complete Line of Lathes for More Than 71 Years

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January 27, 1958
Vol. 142 No. 4

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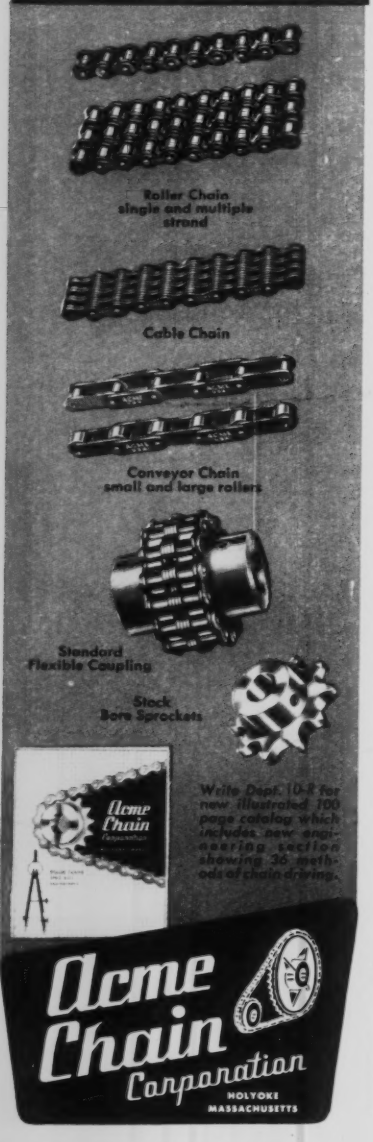
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Cable Chain
Conveyor Chain
small and large rollers
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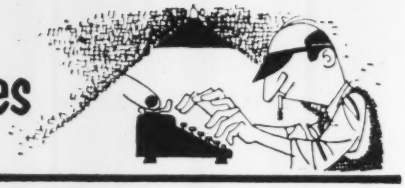
behind the scenes



Modern Saga

Iceland used to export such interesting items as wool, oil, fish, horses, feathers, sulfur, and moss. It doesn't seem likely that a country producing such treasures would attract pirates, but it sure enough did. In 1627, Algerian pirates landed in Iceland and murdered so many inhabitants the authorities lost count, possibly because most of the authorities were carried off into slavery, and naturally they had other things to think about. Eighty years later, smallpox invaded Iceland and killed off 18,000 persons. No wonder some of the remaining inhabitants moved to North Dakota. Among them were the grandparents of Nolan G. Thorsteinson, newly appointed assistant editor, STEEL.

Nolan grew up on the prairies, about 25 miles from the spot where the Red River of the North flows across the international boundary into Manitoba. In a signed confession, he admitted that he left the Red River Valley on a motorcycle, which was at least a variation. Anyway, the girl who loved him so true didn't live in the Red River Valley: She lived in Cleveland; her name is now Patricia Thorsteinson, and she and Nolan are the parents of four children.

Between motorcycle trips, Nolan served in the U. S. Air Force, went to Valparaiso University, worked in the Electronics Div. of Thompson Products, Cleveland, and spent much time considering why Iceland's ponies are built so close to the ground.

Urge To Merge

Assistant editors are solidly in the news this week. Bill Wallace assembled much of the article on the merger situation (see Page 48). He did his assistant editoring by reading, calling, interviewing, adding, subtracting and dividing, and when he had reduced his information to its proper pith and content, it even astounded him.

"Why do companies merge, Mr. Wallace?" we asked archly. "Our impatient readers can scarcely wait to get past Page 6 to abandon themselves to your instructive prose. Can't you give them a little hint here?"

Mr. Wallace smiled, even more archly. He had all the answers, and he knew it. "Business enterprises merge for a variety of reasons. They do it to salvage something from a failing outfit, to acquire a tax loss carryover, or to latch on to desirable facilities and personnel. Some do it simply because they can't resist an attractive offer."

Sometimes remarkable combinations occur. A coal mining company acquired men's underwear; a woolen and worsted firm took over perfumes and cosmetics; a food outfit moved into plastic balloons. Natural mergers, one would think. Coal miners have to have clean underwear eventually; the scent that clings to woolens can be camouflaged with perfumes, and where else but up does food seem to be going?

The urge to merge grows stronger in boom times. This period is regarded as open season by the Federal Trade Commission, and one may see its minions prowling about, armed with Section 7 of the Clayton Act, wherever mergers are encountered. A dissenting opinion of the U. S. Supreme Court, however, takes the view that companies that emerge purged after they merge are seldom a scourge, in spite of what the FTC might urge. In fact, many of these companies create a respectable splurge, and often a new surge of business. It is the exception that sings a dirge. (In self-defense, we'll now submerge.)

Belt Those Wheels

The following was sent by an anonymous machinist who is evidently a sadist. We feel sure the item was plucked bodily from a textbook, and because the last time we looked into a textbook was shortly after James Abram Garfield was shot, we got lost figuring circumferences. Here we go: A moving belt drives two flywheels whose diameters are 30 in. and 50 in. If the smaller wheel turns through 280 rpm, find the speed of the belt in feet per second and the angular speed of the larger wheel in revolutions per minute.

Shrdlu

(Metalworking Outlook—Page 31)

Winner by three points!

The goals are always in *your* favor when you have CIMCOOL° Concentrate on the job in your plant. Here's why CIMCOOL leads the league—actually is the largest selling chemical cutting fluid in the world—winning by three big points:

CIMCOOL LOWERS COSTS because it's longer lasting in machines. Thus, it reduces downtime and cuts labor costs for cleaning and changing.

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So get in the winning column. See your CIMCOOL distributor. He'll give you full information on *all* the advantages of CIMCOOL Concentrate—as well as details on the entire family of CIMCOOL Cutting Fluids.

Or contact us direct and we'll have one of our Cincinnati Milling-trained machinists call on you—without cost or obligation. Write, wire or telephone Sales Manager, Cincinnati Milling Products Division, Cincinnati 9, Ohio.

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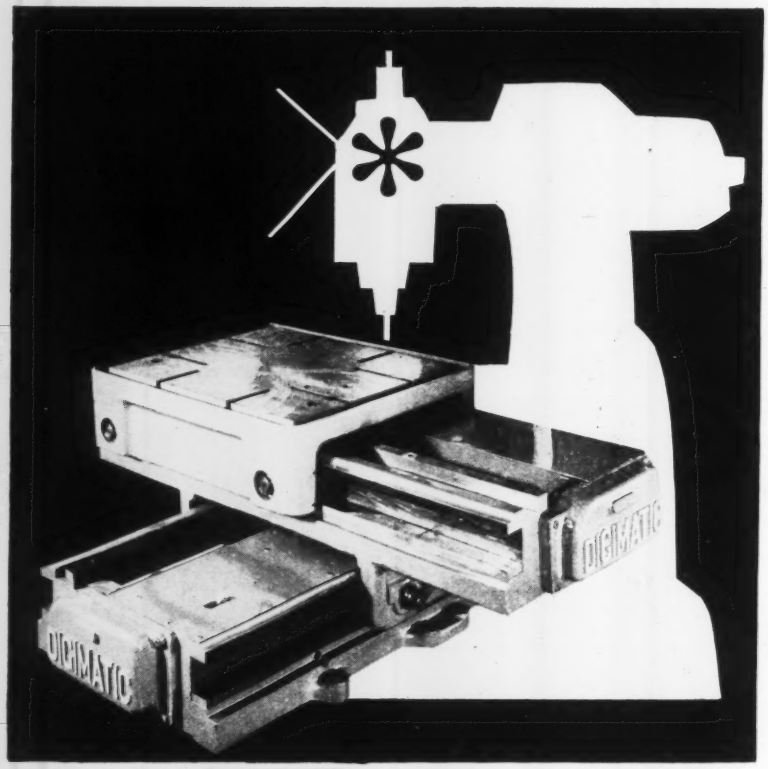

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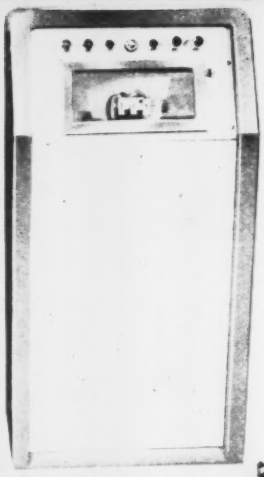

DIGIMATIC Compound Servo Table. Accuracy: ±0.001. Adapts to any drilling equipment. One day installation.

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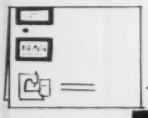

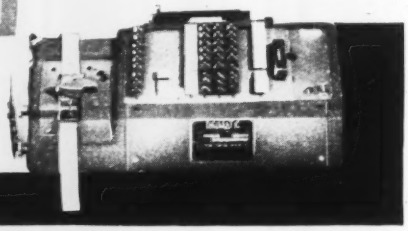

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DIVISION OF **STROMBERG-CARLSON COMPANY**

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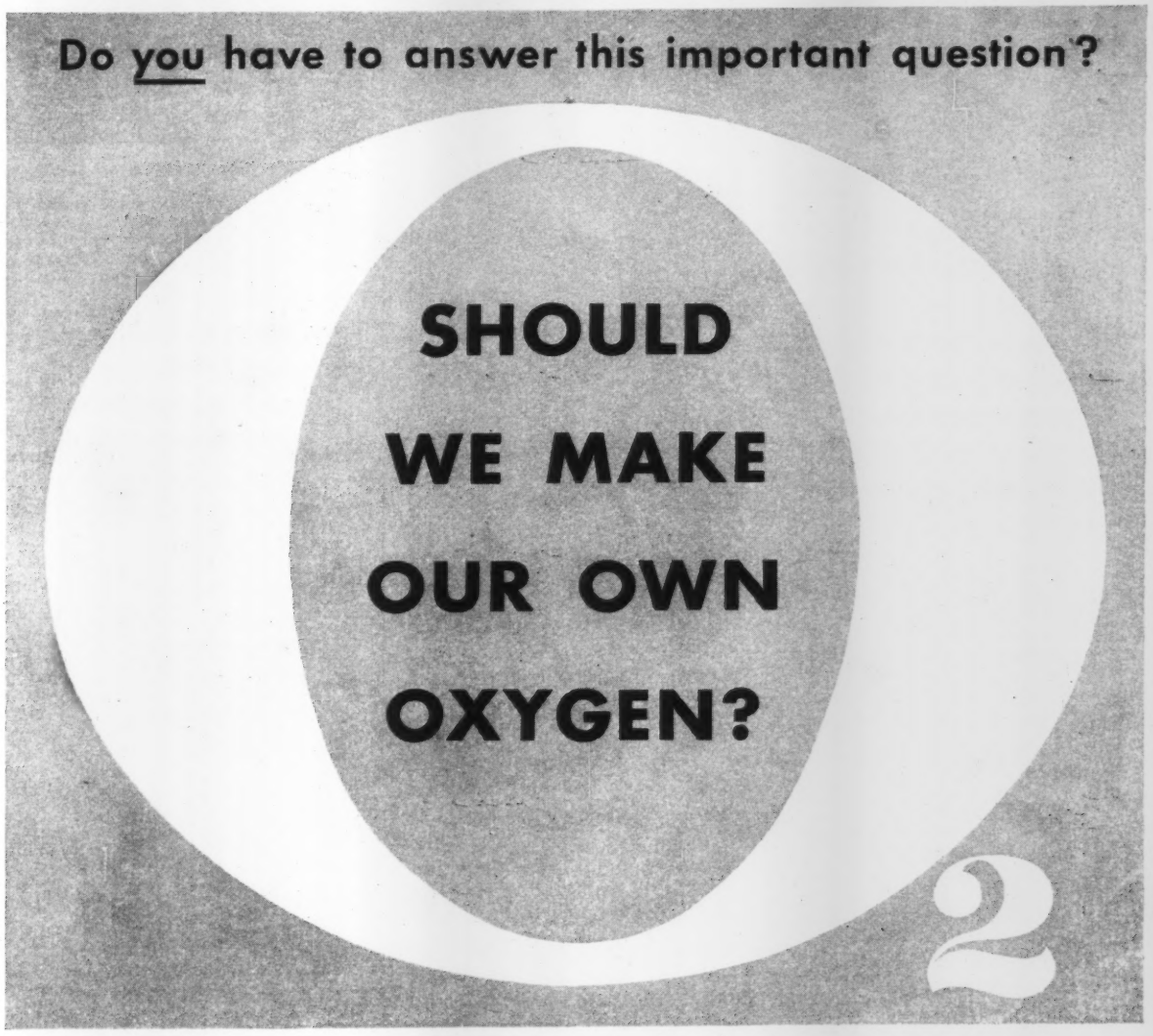

More and more manufacturers are considering this question today, as the use of oxygen in industry continues to expand.

GET THE STRAIGHT ANSWER

As a leading supplier of oxygen-producing plants to all industries, Messer can give you an authoritative and unbiased answer to your own specific inquiries into this problem. In many cases, it may be more economical to purchase oxygen from reliable gas producers. If this is true in your case, Messer will tell you so.

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ALL-NEW DRY CHEMICAL EXTINGUISHER KILLS FIRE FASTER, EASIER!

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LETTERS
TO THE EDITORS

Lauds Yearbook Issue

We would appreciate three copies of your articles, "Management Expects Sales Volumes To Hold at High Level in 1958" (Page 119) and "Marketing Shifts into High Gear" (Page 115), in your Jan. 6 issue.

We wish to congratulate you on an interesting and informative issue. Such editorial matter is a credit to your publication.

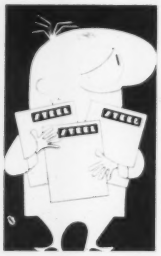
C. A. Ettinger
Account Executive
Ettinger Advertising Agency
Cedar Rapids, Iowa

Notes Little Understood Factors

I would appreciate four copies of the article, "Ferrous Castings Stretch Your Dollars" (Jan. 13, Page 70). It brings out several factors little understood. I wish to distribute these copies to interested personnel.

William E. Davis
Plant Metallurgist
General Steel Castings Corp.
Granite City, Ill.

Annual Data Are Excellent



Your 48-page section, "Facts and Figures of the Metalworking Industry" (Page 159), in your Yearbook (Jan. 6) is excellent. We would like three reprints for use in the development planning section of our engineering department.

F. R. Grisak
Technical Specialist
Development Planning
Temco Aircraft Corp.
Dallas

Practical Ideas Are Presented

Your article, "How To Test Solvent Quality" (Jan. 13, Page 86), presents some practical ideas we would like to forward to our sheet metal venders. May we have four copies?

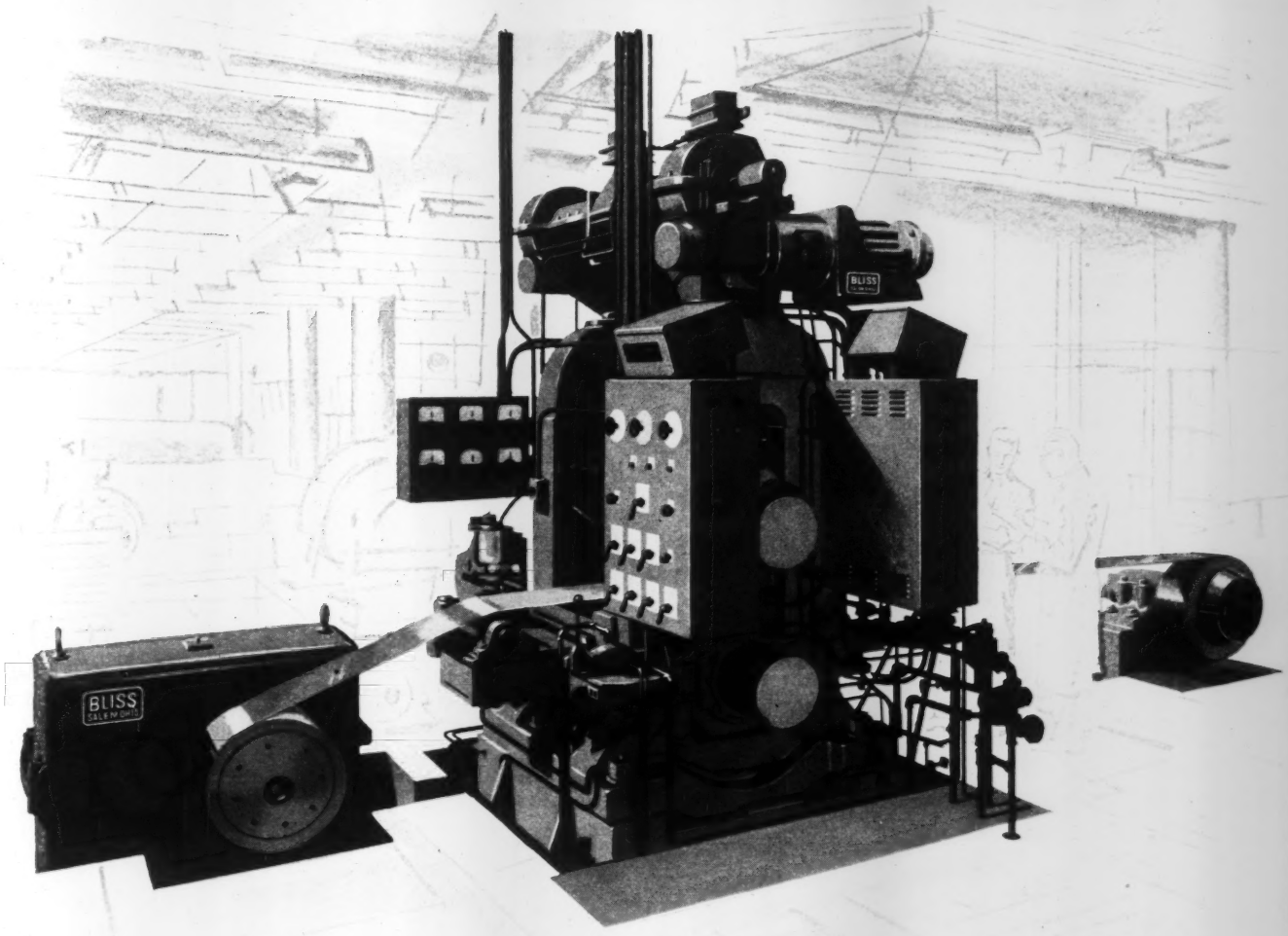
D. H. Blackmar
Chief Metallurgist
LeRoi Div.
Westinghouse Air Brake Co.
Milwaukee

Swedish Car Production Figures

Your article, "Sweden Eyes Auto Market" (Dec. 9, Page 125), reports that in 1957, Sweden more than doubled its 1956 production of cars. Unfortunately, that wasn't possible.

Total production of cars only increased from some 38,000 in 1956 to some 50,000 in 1957; production of trucks, from 17,000 to 18,000. This meant that the

(Please turn to Page 12)



This Bliss 4-high reversing mill is the principal unit in National Cash Register's new cold rolling department.

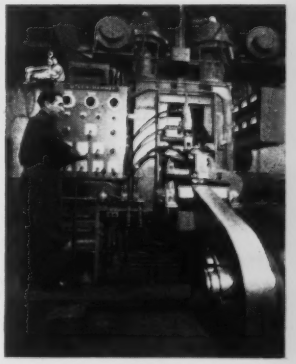
When does it pay to "roll your own"?

The National Cash Register Company's Dayton, Ohio, plant had a problem. It couldn't always get enough special strip for the stamped parts of its business machines.

National Cash Register solved the problem by deciding to "roll its own"—and then asked Bliss to help work out the equipment it would need. The end result is a complete cold rolling department, designed and built by Bliss. It includes a 4-high 5¾" and 16" by 12" reversing mill, a 14" shear line, and a 12" slitting line.

Today, National Cash Register tailors standard steel strip to the exact thicknesses, widths and lengths it needs. Its new Bliss equipment turns material out fast and economically, and there are no more shortages to plague the plant's press department.

This installation shows how Bliss engineers can solve a customer's problem. To see how Bliss has handled others, write today for a copy of the 60-page Bliss Rolling Mill Brochure, Catalog 40-A. It's yours for the asking.



Bliss mill rolls 10"-wide strip down to .009" at speeds up to 400 fpm.

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100 years of making metal work for mankind

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Write Dept. A for catalog 54 and new stock list.

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Coming February 3 in

STEEL

The Cost Crisis:

How To Beat It

In the last 30 days STEEL has interviewed nearly 500 metalworking executives, asking: What will be your major problem in 1958? Most answered: Controlling costs.

Then, this question was asked: Where's your most promising opportunity to control costs? Most answered: Through revamped production facilities or the purchase of new and more efficient equipment.

With that evidence of a serious problem and that indication of the way it can be solved, STEEL next week launches a new series on the cost crisis and how to beat it.

LETTERS

(Concluded from Page 10)

domestic demand for Swedish cars could not be entirely satisfied.

However, the export of cars did show a rise from 4000 in the first nine months of 1956 to 10,000 in the corresponding period in 1957.

Dr. Erik Ruist
Jernkontoret
Stockholm, Sweden

STEEL Does Wonderful Job

Do you have available a tabulation showing steel shipments by months over a period of several years? If you have, I could keep this tabulation up to date by reading STEEL.

I have said it before, and I'll say it again . . . STEEL does a wonderful job in supplying a current economic and market outlook.

A. Mossiman
Manager, Market Research
Anaconda Wire & Cable Co.
New York

● *We are forwarding this tabulation, compiled from information supplied by the American Iron & Steel Institute.*

Settle Grievances Quickly

Please send a copy of the article, "How To Cut Grievances" (Dec. 23, 1957, Page 40). I enjoyed this article a lot and would appreciate a copy for my own use.

O. D. Mann
Industrial Relations Manager
Liberty Powder Defense Corp.
Wabash River Ordnance Works
Newport, Ind.

Please send a copy of this excellent article.

J. C. Hamilton
Director of Industrial Relations
Cornish Wire Co. Inc.
Williamstown, Mass.

Wrong Identification

In your Yearbook issue (Jan. 6, Page 369), you identify me as president of Buck Mfg. Co., Detroit. I'd appreciate it if you'd let your readers know I'm president of Huck Mfg. Co.

A. W. Armour III
President
Huck Mfg. Co.
Detroit

Reports Are Well Received

Your reports pertaining to grievances and training of foremen have been well received. Please forward five copies of the article, "Management's First Line," (Oct. 14, 1957, Page 76).

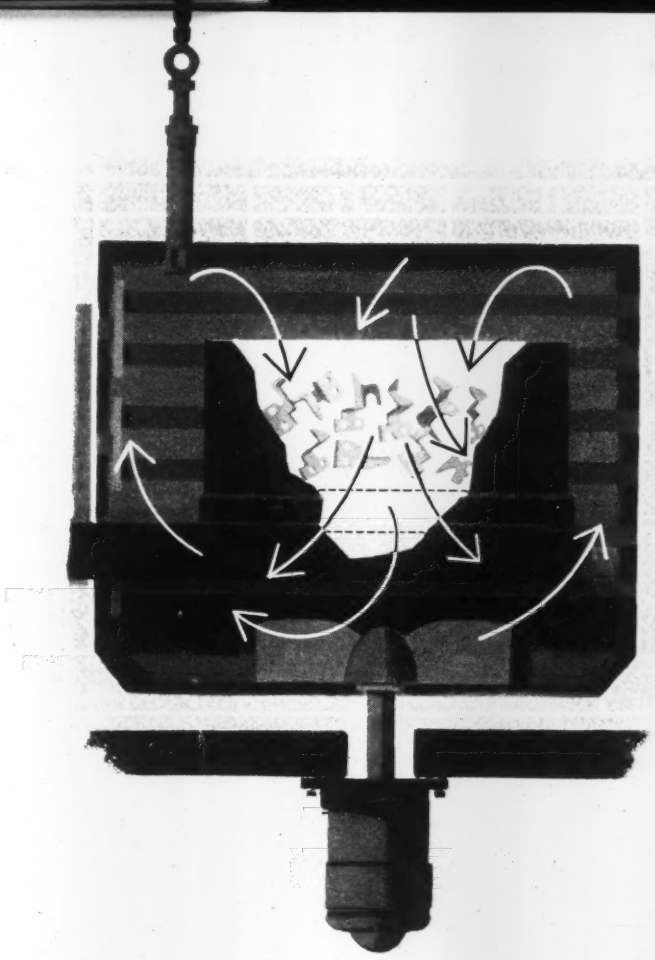
J. Seccombe
Manager, Industrial Relations
Canton Forge Plant
Chassis Parts Div.
Ford Motor Co.
Canton, Ohio

Joints Do Conduct Electricity

In my comment in your Forum on Technical Progress in the Yearbook issue (Jan. 6, Page 378), one sentence indicates that Koldweld joints do not conduct electricity as well as solid, unjoined metal.

The sentence should read, "The conductivity of such joints . . . is not less than that of an equivalent section of unjoined metal."

Verne Clair Jr.
Utica Drop Forge & Tool Div.
Kelsey-Hayes Co.
Utica, N. Y.



it's new!

The L&N Tricarb method with controlled atmosphere . . . temperature . . . quench

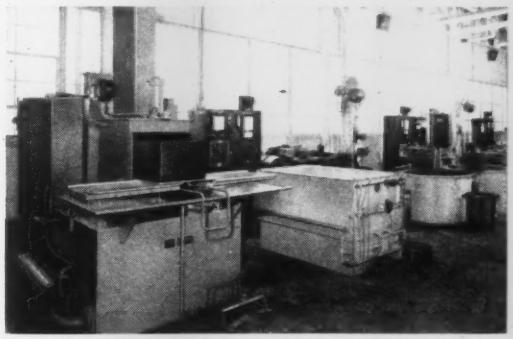
This precision furnace is the most versatile in the history of heat treating. It can be used interchangeably for controlled case carburizing, carbonitriding, homogeneous carburizing, carbon restoration, or hardening.

The unique combination of Microcarb atmosphere control, Speedomax® temperature control and the controlled quench, makes possible significant quality improvements in production heat treating. New, efficient, L-O voltage radiant tube heaters are rugged, requiring minimum maintenance—are not subject to failures from carbon deposits when the furnace is used for carbonitriding without Microcarb control.

In many instances the Tricarb method has proved a practical solution to lower production costs . . . higher quality . . . more process automation . . . elimination of rejects and spoilage. In others it makes thoroughly practical the handling of many previously impossible or difficult heat treatments on a reproducible, production basis.

Folder T-620(17) explains the Tricarb Method. Write us at 4957 Stenton Ave., Phila. 44, Pa.

LEEDS & NORTHRUP
Instruments Automatic Controls • Furnaces



When small cams for electrical instruments are carburized in this Tricarb furnace, 6¢ per piece is saved on subsequent buffing operations because work comes from the furnace so clean.

A.O. Smith offers 24-48 hr.

All types, 1/3 to 800 hp . . .

Any of the standard motors listed at right can be furnished from stock in strategically located A. O. Smith warehouses. Even motors requiring minor modifications can be shipped from the factory within 72 hours.

motor delivery everywhere!

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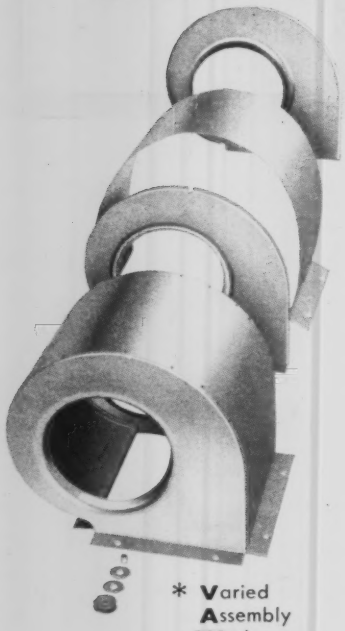

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Tough TAPE that takes print!

Retaining brand identification on both product and container was a difficult job for this manufacturer—until he thought of tape. Now, printed "Scotch" Brand Acetate Fibre Tape does it quickly, easily—and economically. Tape resists scuffing and abrasion—sticks tight to coated surface of chain links.

Perhaps *you* have a need for just such a tape. It's wet-proof, long-aging and sticks to most any surface. It's available in 12 brilliant colors—plus transparent.

Or perhaps you have a need for one of the 300 other "Scotch" Brand Pressure-Sensitive Tapes. If so, please write. We're anxious to help you. And there's no charge or obligation, of course.

ACETATE FIBRE TAPE . . . *one of over 300 Pressure-Sensitive Tapes, trademarked . . .*

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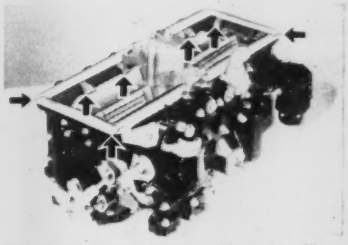
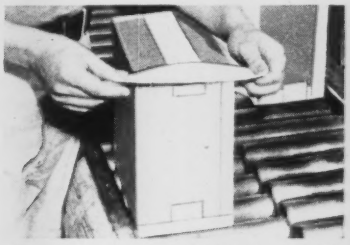
SCOTCH
BRAND

Look what you can do with it!

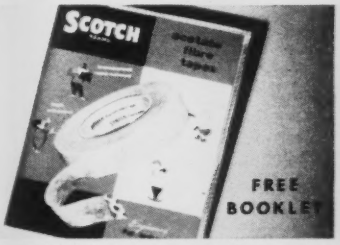
PACKAGE parts and products quickly, easily, with "Scotch" Brand Acetate Fibre Tape and Automatic Box Sealer S-70. Acetate fibre tape can be printed with sales message, if desired.



SIMPLIFY PRODUCTION with tape. Here you see "Scotch" Brand Tape No. 700 used to seal small carburetor openings against dirt. Different colored tapes facilitate inspections.



SEAL cartons against moisture with "Scotch" Acetate Fibre Tape No. 710. Adheres quickly and securely; forms a strong seal that resists abrasion and scuffing. This tape can "take it!"



SEND FOR free folder describing remarkable physical properties of "Scotch" Brand Acetate Fibre Tape and giving valuable use suggestions. Write on your letterhead to "3M" Co., St. Paul 6, Minn., Dept. GK-18.

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One portion of the Verson engineering department where every day hundreds more man-hours are being added to the impressive total.

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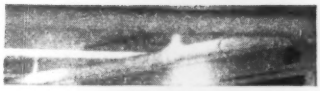

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Do you have an unusual problem in the press forming of metal? If so, solve it the easy way. For over 30 years Verson has specialized in solving "unusual" problems. The results of over 5,000,000 engineering man-hours are in our files. Here is a storehouse of ready made answers on which you can draw for the solution of your problem.

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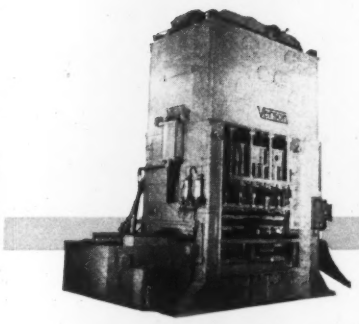

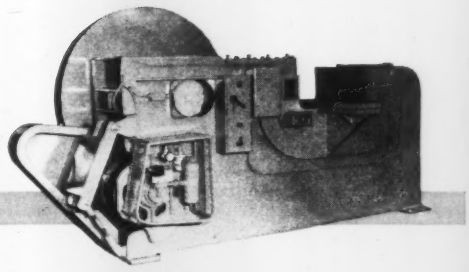

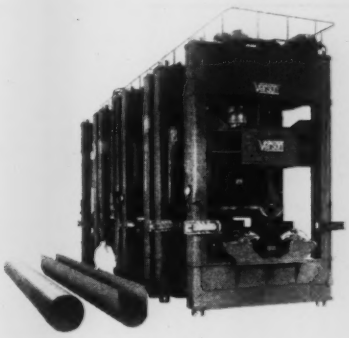

A Verson Press for every job from 60 tons up.

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CORROSION-RESISTANCE, PLUS EXCELLENT PAINT HOLDING SURFACE, are two of the outstanding features of Republic Terne Plate. Moreover, the terne metal coating won't crack, flake or peel even under severe forming operations. Terne Plate is ideal for oil filter and condenser cans as shown above, as well as for gas tanks, mufflers, radiators, air filters, vacuum tanks, TV chassis and many other applications.

REPUBLIC

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World's Widest Range of Standard Steels

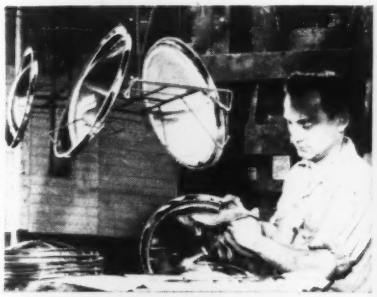
and PRODUCTION with low-cost, Republic Terne Plate

Republic Long Ternes provide a unique combination of advantages to help boost product performance and simplify production, with maximum economy. Reason is Republic's uniform, tight coating of terne metal—a combination of lead and tin—available on all types of coiled sheets in widths up to 36".

In addition to its high corrosion-resistance, Republic Terne Plate provides an excellent paint-holding surface requiring no preliminary preparation. The coating itself is applied by the continuous hot dip method to assure uniform thickness and a tight bond with the base steel. As a result, Republic Terne Plate can be subjected to severe forming operations without damage to the coating. Further, the terne metal coating acts as a lubricant, helping to extend die life and, in some cases, permitting a reduction in the number of drawing operations required to produce a given product.

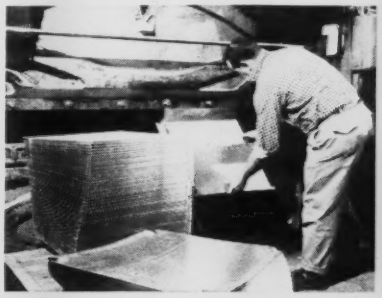
Republic Terne Plate can also be furnished in cut lengths to suit user requirements. Prices are comparable to galvanized steel. However, economies in production and finishing tend to offset or eliminate any added cost in the finished product.

It will pay you to get the full story on Republic Terne Plate, one of the most versatile of all mass production fabricating materials. Simply contact your local Republic representative, or mail coupon for information.



HEAVY-DUTY PERFORMANCE PLUS LIFE TIME BEAUTY are assured in products like these automobile wheel covers, when they are fabricated of Republic ENDURO® Stainless Steel. There is no applied surface to crack, chip, peel or wear away. ENDURO provides excellent resistance to corrosion, heat, abrasion and denting. Send coupon for facts.

PRODUCTION AND APPLICATION PROBLEMS WERE SOLVED when the Kelley Manufacturing Company, Houston, Texas, standardized on Republic Electro Paintlok® for fabrication of acoustical fastening members. The chemically treated zinc surface of Electro Paintlok provides corrosion-resistance and paint holding properties. Coating is unharmed by the most severe forming. For data, send coupon.



LOWEST COST CORROSION PROTECTION for fabricated sheet products is secured through use of Republic Continuous Galvanized. A good example is the beverage cooler liner box shown being fabricated. Republic Continuous Galvanized is sheared, blanked, pierced, formed, flanged, soldered, beaded, and Pittsburgh Lock Seamed. Its tight zinc coating remains unaffected. Send for details.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
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☐ Manufacturers Terne Plate ☐ Electro Paintlok
☐ ENDURO Stainless Steel ☐ Continuous Galvanized

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Company_____

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City_____ Zone____ State_____

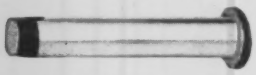
"Full-round" design of Link-Belt LXS chain avoids stress raisers

ROLLERS are accurately machined for correct operating clearances and free-rolling action.

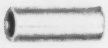
SIDEBARS of selected steel have accurately machined "full-round" pitch holes, which maintain firm, tight press fit of pins and bushings.

FOR POWER TRANSMISSION, LXS chain is generally supplied with offset sidebars. Uniform stress distribution provides extra chain life and safe dependable operation.

FOR CONVEYING AND ELEVATING, LXS chain with straight sidebars and rollers to meet varied operating conditions. A wide variety of attachments is available.



"FULL-ROUND" PINS are made from a tough steel, specially treated for high strength in shear . . . sized for controlled press fit to prevent rotation in sidebars.



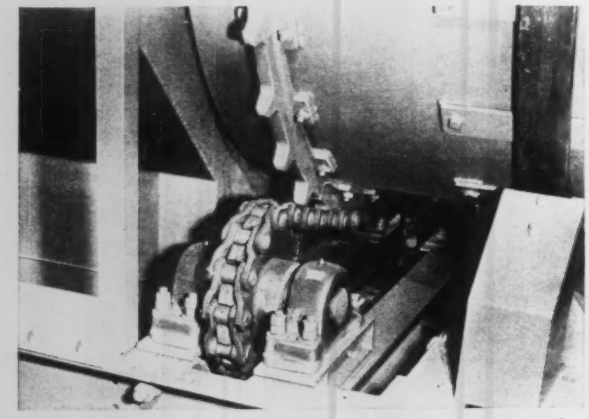
"FULL-ROUND" BUSHINGS are properly hardened to shrug off shock, resist wear . . . accurately sized for controlled press fit to prevent rotation in sidebars.

Greater live bearing area extends life

Stress concentration points are eliminated in Link-Belt LXS chain! "Full-round" design avoids sharp corners which may be the starting points of chain failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly . . . long chain life is assured under severe conditions.

Pins and bushings of LXS chain are accurately sized . . . assuring controlled press fits, preventing rotation in sidebars. Similar accuracy in machining of sidebars permits close control of pitch and proper chain length after assembly.

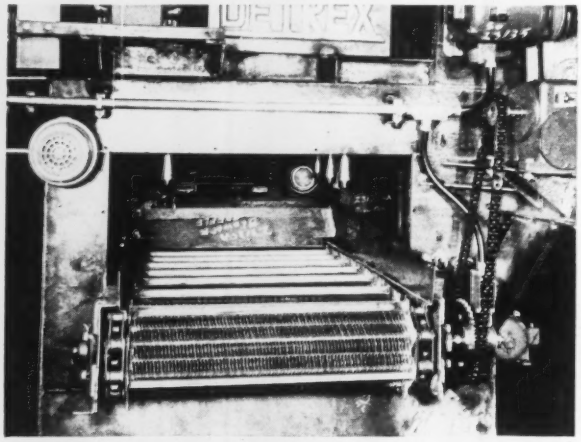
Other long-life features of Link-Belt LXS chain include use of selected steels and controlled hardening of all parts. Both contribute to greater endurance . . . greater uniformity.



LXS drives stand up to impact and abrasive service

Large, live bearing area makes LXS chain ideal for exposed drives and abrasive conditions such as found on this heavy rotating drum. Uniform distribution of load over ample bearing area reduces cutting action of abrasives . . . extends chain life.

LXS chain has stamina required for long, heavy-duty conveyors



With its exceptional strength and wear resistance, Link-Belt LXS chain can easily meet rugged conveying and elevating requirements. Due to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life necessary for the extra-long conveyors so important to today's highly mechanized industry.

HEADQUARTERS for chains, sprockets and other Link-Belt products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Refer to the Yellow Pages of your local Phone Directory.

LINK-BELT

CHAINS AND SPROCKETS

14,740

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

CALENDAR
OF MEETINGS

Jan. 27-28, Industrial Heating Equipment Association: Annual meeting, Penn Sheraton Hotel, Pittsburgh. Association's address: Associations Bldg., Washington 6, D. C. Executive vice president: Robert E. Fleming.

Jan. 27-30, Plant Maintenance & Engineering Show and Conference: International Amphitheatre, Chicago. Information: Clapp & Poliak Inc., 341 Madison Ave., New York 17, N. Y.

Jan. 30-31, Steel Plate Fabricators Association: Annual meeting, Roosevelt Hotel, New Orleans. Association's address: 105 W. Madison St., Chicago 2, Ill. Secretary: J. Dwight Evans.

Feb. 3-7, American Institute of Electrical Engineers: Winter general meeting, Statler and Sheraton-McAlpin Hotels, New York. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Feb. 4-6, Society of the Plastics Industry Inc.: Reinforced plastics division conference, Edgewater Beach Hotel, Chicago. Society's address: 250 Park Ave., New York 17, N. Y. Executive vice president: William T. Cruse.

Feb. 5-7, Alloy Casting Institute: Midwinter meeting, Ponte Vedra Club, Ponte Vedra Beach, Fla. Institute's address: 286 Old Country Rd., Mineola, N. Y. Executive vice president: E. A. Schoefer.

Feb. 5-8, National Tool & Die Manufacturers Association: Winter board meeting, Ambassador Hotel, Los Angeles. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

Feb. 6-7, American Coke & Coal Chemicals Institute: Winter meeting, Drake Hotel, Chicago. Institute's address: 711 14th St. N. W., Washington, D. C. Executive secretary: Bernard M. Fitzgerald.

Feb. 6-7, Malleable Founders' Society: Technical and operation conference, Wade Park Manor, Cleveland. Society's address: 1800 Union Commerce Bldg., Cleveland 14, Ohio. Executive vice president: Lowell D. Ryan.

Feb. 10-12, American Management Association: Marketing conference, Hotel Statler, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Feb. 10-14, American Society for Testing Materials: Committee Week, Statler Hotel, St. Louis. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Feb. 11-13, Investment Casting Institute: Annual meeting, Roosevelt Hotel, New York. Institute's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

Feb. 14-15, National Association of Metal Finishers: Winter meeting, Dinkler-Plaza, Atlanta. Association's address: 60 Bentley Rd., Cedar Grove, N. J. Executive secretary: P. Peter Kovatis.

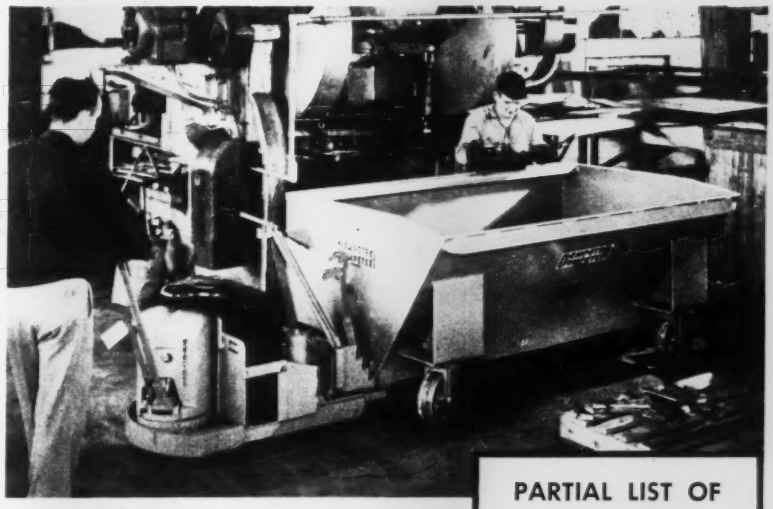
Feb. 15-19, American Institute of Mining, Metallurgical & Petroleum Engineers: Annual meeting, Statler and Sheraton-McAlpin Hotels, New York. Institute's address: 20 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

Feb. 17-19, American Management Association: Midwinter personnel conference, Palmer House, Chicago. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Feb. 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston Hotel, New York. Association's address: 27 E. Monroe St., Chicago 3, Ill. Executive secretary: H. P. Dolan.

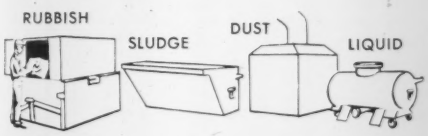
Feb. 19-21, American Management Association: Special research and development conference, Biltmore Hotel, New York. Association's address: 1515 Broadway, New York 36, N. Y. President: Lawrence A. Appley.

Industrial Leaders "CONTAINERIZE" Waste As It Accumulates



Dempster-Dumpster System Provides Temporary Storage at Points of Waste Accumulation

Enclosed temporary storage of waste is the key to plant cleanliness and low-cost disposal. Clean Dempster-Dumpster Containers, placed at major inside and outside waste accumulation points, perform this vital function. Costly rehandling is eliminated; one man and one truck-mounted Dempster-Dumpster dispose of all waste from your plant . . . picking up, hauling and dumping containers on a planned shuttle schedule. This low-investment System generally pays for itself in 18 months or less.



WRITE TODAY for your free copy of the new manual, "How to Cut Industrial Waste Disposal Costs."

Dept. S-2 DEMPSTER BROTHERS, Knoxville 17, Tenn.

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THE DEMPSTER DUMPSTER SYSTEM

CONTAINERIZED WASTE IS PICKED UP . . .

HAULED . . .

. . . AND DUMPED

more
and
more
steel plants
are using

GOOSE LAKE LADLE BRICK

Excellent resistance to slags, spalling, and abrasion are the reasons back of this increasing acceptance

Goose Lake Fire Brick is a dense, well-burned plastic-fire clay brick—ideal for iron and steel ladles, cupolas, and general intermediate heat-duty requirements—specified by leading steel men.

To meet the constantly increasing demand and still insure prompt delivery, we've had to double our output.

Goose Lake Fire Brick is produced at Goose Lake, only 55 miles from Chicago. Fast, dependable delivery can be made by truck or rail. Write for details.

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main office: Joliet, Illinois; Barber Building
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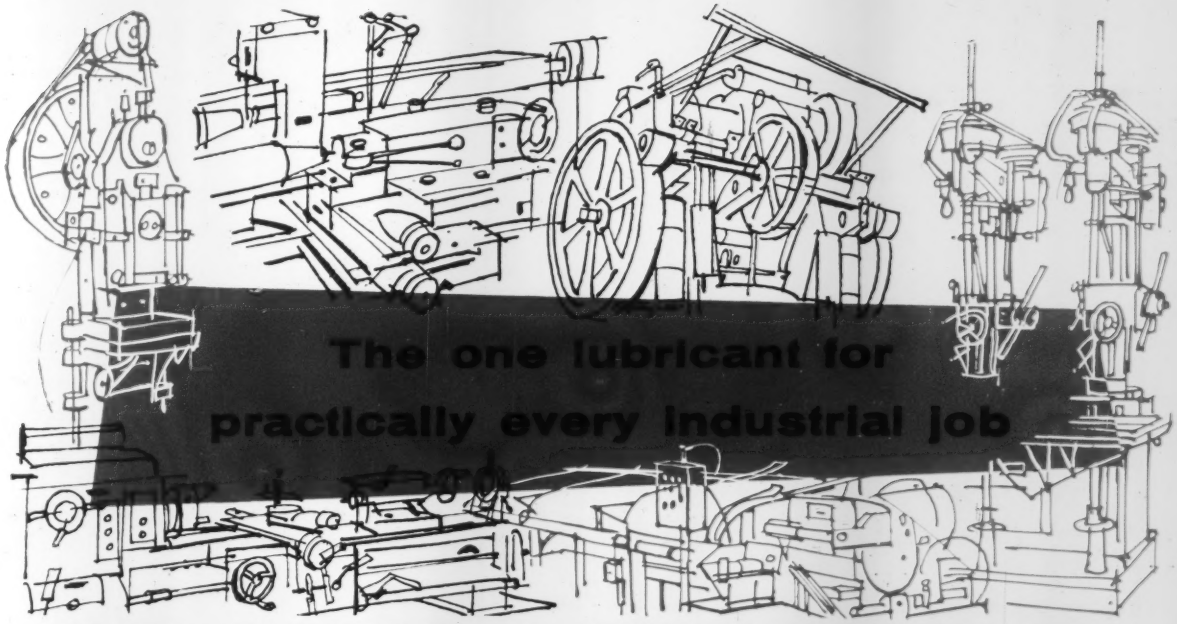
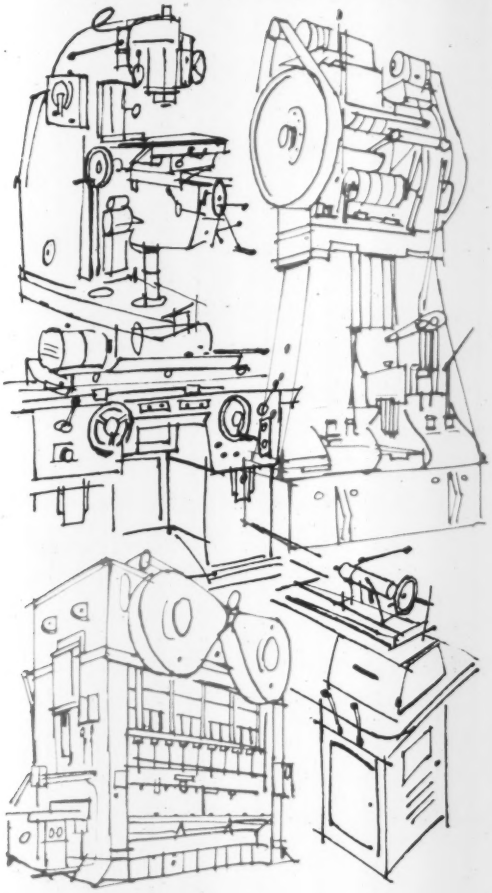
MANUFACTURERS OF:

GOOSE LAKE Ground Fire Clay, Fire Clay Flour, Grundite Bond Clay, Fire Clay Brick, Firox; THERM-O-FLAKE INSULATION Coating, Brick, L.B. Block, Concrete; CHEM-BRIX, Silica, Carbon.



ATLANTIC LUBRICANT 54

Performs on all types of grease-lubricated machinery • Cuts cost • Reduces lubricating errors



Atlantic Lubricant 54—an outstanding multi-purpose lubricant—assures:

- **Wider application**—almost universal application to grease-lubricated equipment in plants of all sizes
- **Excellent performance** at very high to extremely low operating temperatures
- **Reduced losses** from lubricating error
- **Lower costs** of warehousing and handling
- **Outstanding rust protection** for all ferrous surfaces
- **Unusual stability** against oxidation and softening—even under very rugged conditions
- **Easy, positive identification**—thanks to Atlantic Lubricant 54's distinctive purple color

Available from conveniently located warehouses. Call any of the Atlantic offices listed below.

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LUBRICANTS • WAXES
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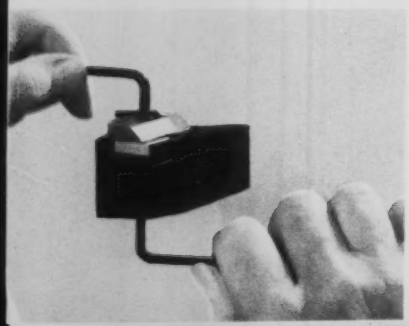
CHARLOTTE, N.C.
1112 South Boulevard

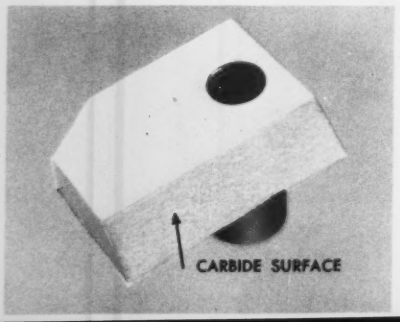
In South America
Atlantic Refining Company of Brazil, Rio de Janeiro

1 New! Self-loosening chipbreaker clamp. A twist of the wrist releases insert for indexing . . . automatically lifts and lowers chipbreaker. No more prying chipbreaker free. No more fumbling with loose chipbreaker. Choice of 3 chipbreaker widths for accurate chip control.

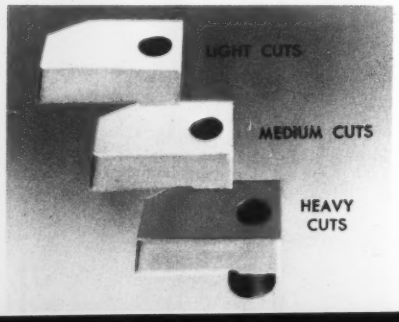
2 New! Setscrew accessible from top or bottom! Screw easily reached when holder is upside down or on its side. Easier indexing from any position.



3 New! Unique carbide-surfaced chipbreaker. New method bonds carbide coating directly to chipbreaker. Ends all possibility of braze failure.



4 New! Three color-coded chipbreakers. Choice of three widths: yellow for light cuts, silver for medium cuts, red for heavy cuts. Makes identification easy.



ANNOUNCING THE ALL-NEW CARBOLOY® LIFT-O-MATIC TOOLHOLDER

Only toolholder on the market with these 6 advanced design features

Indexes faster, easier – from any position. Setscrew on Carboloy Lift-O-Matic Toolholder can be turned from either top or bottom. Even if the holder is upside down, or on its side, the setscrew is always easily accessible.

What's more, the clamp and chipbreaker are in one piece – and rise automatically when the setscrew is loosened. There's no time wasted in fumbling with the chipbreaker or prying it free.

Reduces set-up time, speeds up production. Because Carboloy Lift-O-Matic Toolholders can be set up faster and indexed right in the machine, downtime is reduced – you get more production.

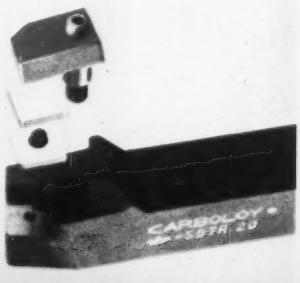
Because of the new holder design and harder steel shanks, you get closer tolerance production . . . less scrap loss.

17 styles in 8 sizes – stocked for immediate delivery. Lift-O-Matic Toolholders are now at your local Authorized Carboloy Distributor. Call today; his name is in the Yellow Pages. Or, for new Lift-O-Matic Toolholder Catalog, write: *Metallurgical Products Department of General Electric Company, 11173 E. 8 Mile Street, Detroit 32, Michigan.*

CARBOLOY®
CEMENTED CARBIDES

GENERAL ELECTRIC

5 New! Fewer parts to replace or stock. Holders use fewer parts. And all are standardized to cover widest range of applications. Means reduced inventories.



6 Insert clears top of the shank. Stops chipping of fresh cutting edges against walls of insert pocket. Inserts are positively clamped; clamp never touches shank.

NEW! TRANSPARENT PACKAGES FOR CARBOLOY INSERTS

New plastic package makes it easy to see what's inside... easy to pick out insert.

Getting your share of today's $400 billion market?

These dynamic and expanding times call for sales methods that measure up to the modern buying market. A tremendous amount of money is spent by industry for needed goods and services—*over $135 million each business day.*

There are many ways in which a company can assure itself of a fair share of our fast-moving industrial market: through sales expansion . . . marketing realignment . . . new products . . . and advertising. One of the most economical ways is with *a well-balanced advertising program!*

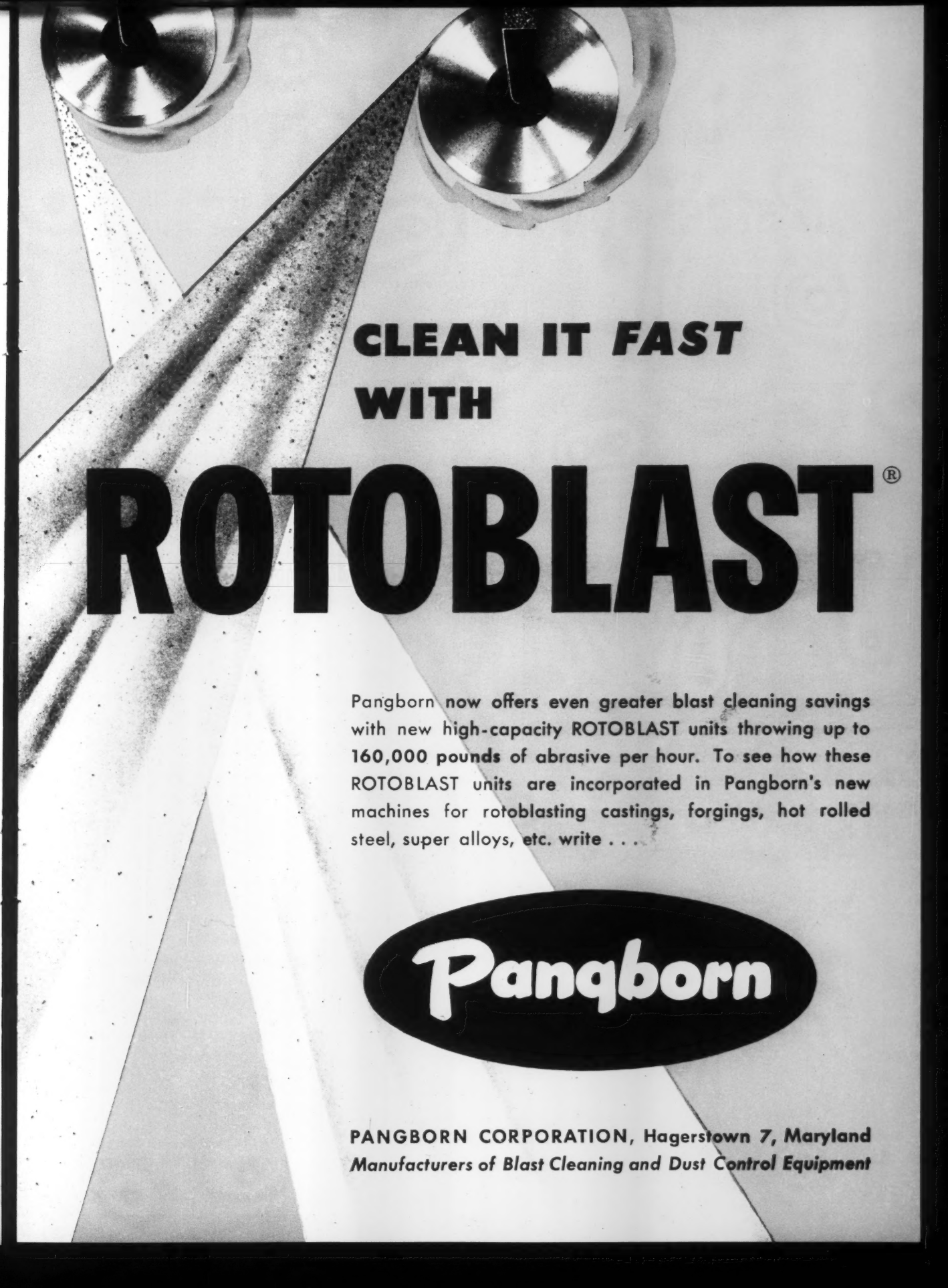
Industrial advertising goes to work at once, reaching and selling more of the people you want—now! It adds effective sales push in all the scattered corners of the vast buying market—as well as in the areas and offices your salesmen don't have time or opportunity to cover. And industrial advertising requires only a fraction of your total sales investment.

One business success after another has proved *it pays industry to advertise to industry.*

NATIONAL INDUSTRIAL ADVERTISERS ASSOCIATION, INC.

271 Madison Avenue, New York 16, N. Y.

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.



CLEAN IT *FAST* WITH

ROTOBLAST®

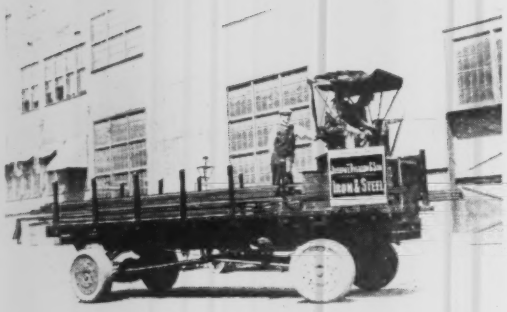
Pangborn now offers even greater blast cleaning savings with new high-capacity ROTOBLAST units throwing up to 160,000 pounds of abrasive per hour. To see how these ROTOBLAST units are incorporated in Pangborn's new machines for rotoblasting castings, forgings, hot rolled steel, super alloys, etc. write . . .

Pangborn

PANGBORN CORPORATION, Hagerstown 7, Maryland
Manufacturers of Blast Cleaning and Dust Control Equipment

3 important check points on steel suppliers

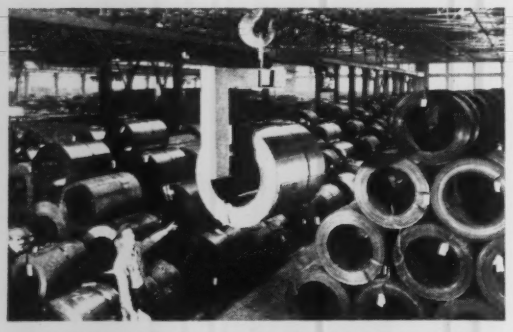
for the buyer with a management viewpoint



In 1917 Ryerson already had 75 years of steel-service experience

DEPENDABILITY AND EXPERIENCE—Is your company establishing a sound business relationship with a supplier of steel from stock who will be willing and able to furnish steel at fair prices next year or five years from now under all market conditions? And is your company dealing with a supplier who can give you the benefit of experience gained in working with tens of thousands of other companies whose problems of steel purchasing, selection and fabrication may be similar to yours?

The supplier with the broadest experience is Ryerson—the nation's largest steel-service organization with a 115-year record of dependable performance.



A small part of the huge steel stocks at one Ryerson plant

CAPACITY TO SERVE—Consider this recent example: It was 10 after 5 P.M. The phone rang and a steel buyer 80 miles away said: "I've got to have 60,000 lbs. of slit coils first thing in the morning." Impossible? Not at Ryerson. The needed steel was on hand in Ryerson stocks—the nation's largest, by far. Unequalled processing equipment was put to work. And during the night coils of two different gauges were slit to size requirements. Early the next morning the steel was delivered as promised—80 miles away. This kind of service takes great capacity—and Ryerson has it.

Spark testing Ryerson bar stocks to avoid mixed steels

QUALITY OF PRODUCT—Mislabelled steel cannot pass skilled Ryerson inspectors who "read" steel sparks to determine carbon content and alloying elements with amazing accuracy. And spark testing is typical of the exacting attention given to quality control at Ryerson. As a result you are sure of getting the third important requisite of satisfactory steel service—steel of known, uniform high quality, accurate in size, gauge, length and weight, and right for your particular application.

In stock: Carbon, alloy and stainless steel—bars, structurals, plates, sheet and strip, tubing, reinforcing steel—aluminum, industrial plastics, metal-working machinery, etc.

RYERSON CERTIFIED QUALITY

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • WALLINGFORD, CONN. • PHILADELPHIA • CHARLOTTE • CINCINNATI CLEVELAND • DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Who Wants UAW's Profit Sharing?

The United Auto Workers' profit-sharing proposals to be presented to the auto companies this spring are none too popular even with labor. The idea isn't new and has been debated among the higher echelons of the AFL-CIO's Industrial Union Department for months. The majority opposed it. But the IUD president, Walter Reuther, decided to pick it up for his own union, despite the opposition of some of his own members, notably Carl Stellato, chief of Ford Local 600.

Coffee Break: Its Costs Mount

Some 71 per cent of the nation's workers—about 27 million—will have a coffee break today. Only 40 per cent enjoyed the privilege in 1950, says the Pan American Coffee Bureau. Some 15 million take their breaks in the morning, 4 million in the afternoon, and another 8 million are doubly blessed with two breaks a day. Assuming that the average coffee break takes 15 minutes and that two sessions are held daily, Associated Industries of Cleveland figures the practice chops 2½ hours off the workweek in many instances and costs $5.72 per week at the average hourly rate of $2.29 in Cleveland. The National Labor Relations Board has even ruled that an employer committed an unfair labor practice when he ended the coffee klatsch privilege without consulting the union. And what does the man who dislikes coffee do? Work?

Electronics To Double by 1965

This nation's electronics industry will almost double its present $12 billion annual volume by 1965, believes Radio Corp. of America's Frank M. Folsom. The growth will primarily be in industrial uses, but color television and national defense will also contribute to the gains. Industrial growth will be 300 per cent, particularly in data processing and in devices for automated sensing and control for production. Color television's volume should double by 1965, and defense spending should be nearly $6.5 billion by then.

Investment Castings' Civilian Use Mounts

Sales of investment castings to nondefense industries should reach an all-time high of more than $19 million in 1958, predicts Vincent S. Lazzara, president of Casting Engineers Inc., Chicago. Until now, about 90 per cent of all investment castings produced ($110 million in 1957) went for defense.

Defense Metal Allotments Slide

Steel, copper, aluminum, and nickel alloy allotments for defense "A" products in the second quarter are all below those for the first quarter. Second period steel allotments (417,000 tons) are 9 per cent lower. Copper (35.2 million

lb) is 16 per cent off. Aluminum (93.3 million lb) is down 10 per cent. Nickel alloys (5.9 million lb) are 25 per cent lower.

Railroads Go to Washington

The House Ways & Means Committee has added to a technical tax bill a provision which would give the nation's railroads an estimated $350 million extra in future depreciation allowances. Chances for passage are good, but the outlook is not so promising for other railroad proposals for government aid—particularly for establishment of a new federal agency to buy equipment, then lease it to the roads.

Transportation Load Soars

Total transportation volume is increasing three times faster than population growth, says Earl E. Kearns, manager of General Electric Co.'s Metropolitan Transportation sales. Although more expressways are needed, the sheer volume of people and goods will require more efficient public transportation methods, he believes. He adds: "One lane of rail rapid transit can speedily move as many seated passengers as 20 freeway auto lanes."

Lower Discount Rates: No Panacea

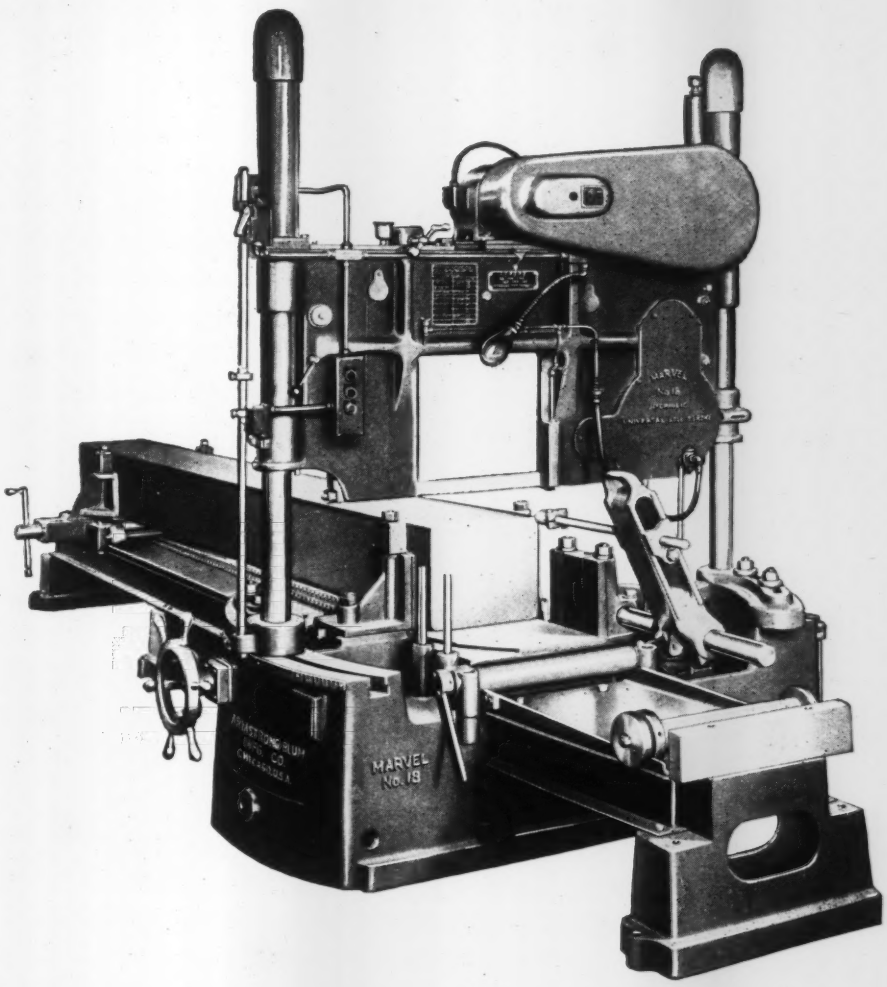
The Federal Reserve Board's lowering the discount rate from 3 to 2¾ per cent will make loans easier to get, but it's no panacea for boomtime prosperity. Commercial banks, such as the Cleveland Trust Co., followed immediately by reducing the prime loan rate from 4½ to 4 per cent. Even at the higher rates, loans have been markedly easier to get in the last few months than they were a year earlier. What the moves will do will be to stir up industry's circulatory system a bit. That, coupled with hoped-for spring upturns in construction and autos, should help recovery.

Troubles in Research

Top management is concerned about communication problems in research and development programs. A survey by the Scientific Apparatus Makers Association, reveals that only one out of seven respondents finds laboratory reports satisfactory. Many executives suggest more personal contact with researchers, more frequent lab reports, and more effort to tell scientists what management's viewpoints are.

Straws in the Wind

The Air Force will try to send a payload to the moon within the next few months, using a Douglas Thor, plus second and third stages of the Martin Vanguard . . . Crucible Steel Co. of America returned to the black in the fourth quarter of 1957 after a net loss for the third quarter . . . Scheduling the production of titanium mill products is no longer required by the U. S. . . . Atomic Energy Commission will offer statutory indemnity to its major contractors, protecting them and the public against losses arising from nuclear accidents . . . Aluminium Ltd. has cut back Canadian operations from 90 to 80 per cent of capacity.



No Job too big or too tough . . .

for MARVEL "*Giant*" Hack Saws

These giant MARVEL Hydraulic Hack Saws (No. 18, Capacity 18" x 18"; and No. 24, Capacity 24" x 24") were *basically* designed for rapid and economical cut-off of BIG WORK. They are not merely "conventional" designs "stretched" to big capacity. They are truly designed and built with the ruggedness and rigidity necessary to withstand the rough treatment of sawing big work, even though the work is in the "toughest of the tough" alloys.

They are reliably fulfilling the cut-off requirements in innumerable steel mills, forge shops, structural shops, warehouses, and machine shops, with assured low tool cost and minimum kerf loss of steel.

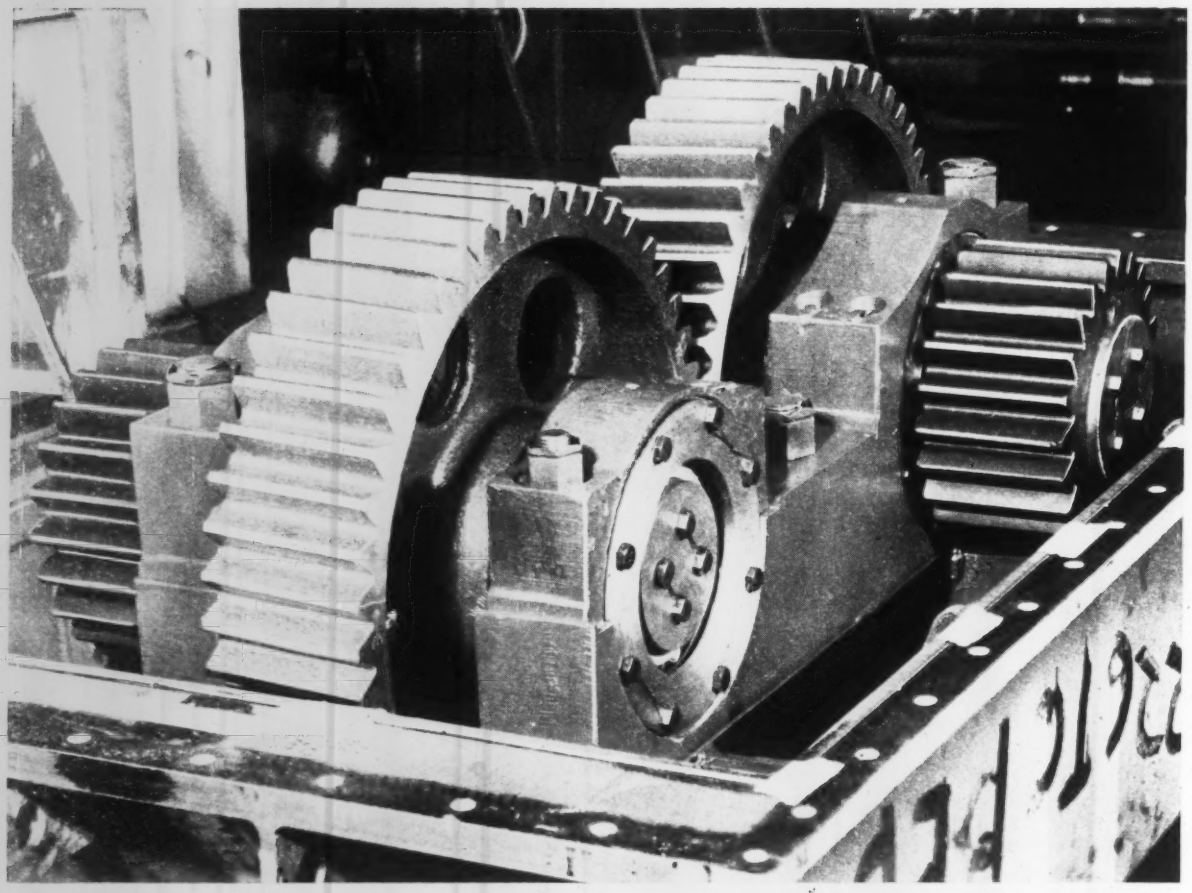
In addition to cutting-off, they are reducing costs by eliminating further machining operations. Heat treated die blocks are being reclaimed for re-sinking by sawing off the worn face; columns, beams, pipe, and tubing are being sawed to *finished*, square ends, eliminating milling; angular sawing is done conveniently by swinging the upper structure on the base, to any angle up to 45 degrees—*without moving the work*.

Contemplating the modern trend toward ever tougher steels and larger sizes, these are the logical sawing machines to buy, not only for today's needs but for tomorrow's as well.

Write for Catalog

MARVEL *Metal Cutting* SAWS
Better Machines—Better Blades

ARMSTRONG-BLUM MFG. CO. 5700 West Bloomingdale Avenue • Chicago 39, U.S.A.



Bliss Specifies Ductile Cast Iron Gears for presses used to form sheet steel for the auto industry. Bliss uses ductile cast iron for at least 10 other parts in top drive presses – 16 in under drive presses.

Ductile cast iron gears prove their economy in Bliss metal-working presses

The gears, illustrated above, are typical of the many ductile cast iron gears used by E. W. Bliss Co. of Canton, Ohio, for their heavy metal-working presses.

For 30" to 108" gears, ductile iron has provided outstanding service. It gives Bliss the best combination of properties: high strength, good castability, good wear resistance and excellent machinability. All this at moderate cost.

In this gear application, 80-60-03 grade ductile provides a yield strength of 60,000 psi – more than enough to meet the stresses developed in producing 300- to 4000-ton platen loads.

These ductile iron gears – heat-treated to 208 Brinell – work well with the 8640 (Ni-Cr-Mo) pinions, assuring top-notch wear resistance. Bliss reports, *"not a single ductile iron gear replaced since ductile iron was first specified."*

Take advantage of the economy of ductile cast iron for your equipment. For many applications – cylinders, pressure vessels, pistons and the like – ductile iron outperforms conventional materials. Cuts production time. Behaves better in the shop. Saves time and money.

For complete information write for "Ductile Iron – the Cast Iron that Can Be Bent."

DUCTILE IRON

ductile iron . . . the cast iron that can be twisted and bent

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street, New York 5, N. Y.

Get Set for the Sixties!

Are you really set for the 1960s?

We cite General Electric Co. as an example of what we mean. As part of a progressive decentralization program, GE has split up its business into a number of smaller segments, each with its own management and responsibilities.

One department, which employs about 500, makes 40 to 125 hp industrial electric motors. Here are some of the factors GE considered in bringing it up to date:

Gaging the Market: GE's marketing people figure industry sales of electric motors from 1 hp upward will increase 30 per cent from 1957 to 1961—$670 million to $870 million.

Product Design: In changing to smaller frames, motors and facilities were designed at the same time. Economies in production were made possible.

Standardized Parts: Less than a third of these motors are standard. Parts were designed that could be assembled in a variety of combinations to meet special requirements.

Automation: GE went as far as it could in applying automatic processing. Its approach included generous use of conveyors to pick up parts and assemblies and deliver them to work stations. In machining frames, three automatic packages of equipment replaced seven that did the same work. Stator and rotor laminations are stamped from coils and stacked automatically. In-line testing detects defective parts before they go too far.

Rapid Deliveries: With a shorter production cycle, 80 per cent of parts for all motors can be made and stocked ahead. Delivery time on special motors has been cut in half and is now four to five weeks. Delivery on standard motors has been set at two weeks.

Customer Inventories: GE feels customers will no longer need to build up excessive stocks of motors during periods of intense business activity. This will help stabilize GE's employment.

Knowing Costs: The new setup not only has reduced costs, but it makes it possible to properly allocate them among classes of motors and price them accordingly. This is expected to encourage the use of more standard motors.

In planning for the future, GE has made sensible use of existing buildings and equipment that could still pay their way. It has created no fantastic Rube Goldberg.

It is the kind of planning you need to think about in getting ready for the 1960s.

Irwin H. Such

EDITOR-IN-CHIEF

facts about LEDLOY* FREE-MACHINING STEELS

The Inland process of adding lead to any steel improves machinability from 25 to 50% without affecting mechanical and metallurgical properties

Ledloy is Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Inland regularly produces Ledloy free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of the chemical composition, *the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel.* All the important qualities of open hearth steels, such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness are retained. Any heat treating, or forging operation that can be performed on similar non-leaded grades of open hearth steels *can be performed* on Inland Ledloy free-machining steels.

What is affected, and to a marked degree, is machinability! Though Inland Ledloy steels contain only about one-quarter of one percent lead, distributed evenly throughout the steel, this small quantity of lead does amazing things to the steel's machinability. On-the-job use consistently shows cold drawn Ledloy can be machined 45% faster than B1113 and 100% faster than B1112. Surface speeds of 325 feet per minute are common and much higher speeds are possible; up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling.

Not only is speed increased, but down-time for tool changes is markedly reduced. The reason is that Inland's process of adding lead to steel lowers the steel's friction component and actually lubricates the cutting tool during machining. Less heat is generated, tool-edge build-up is minimized and tool life is increased considerably.

Ledloy steels' shorter-length chips generally fall clear of the tool and Ledloy's lubricant characteristic aids in preventing chips from welding to the tool.

Ledloy steels are especially clean-cutting and machine to a fine, smooth finish — smoother than that obtained with other free-cutting steels — making dimensional tolerances easier to maintain. In practically all cases, Ledloy steels may be fabricated—sheared, bent, formed, torch-cut, welded, brazed—in the same manner used for steels of the same base chemical composition and with equal or better results.

Many grades available—Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steel. Ask your cold-drawer about it today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

INLAND STEEL

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

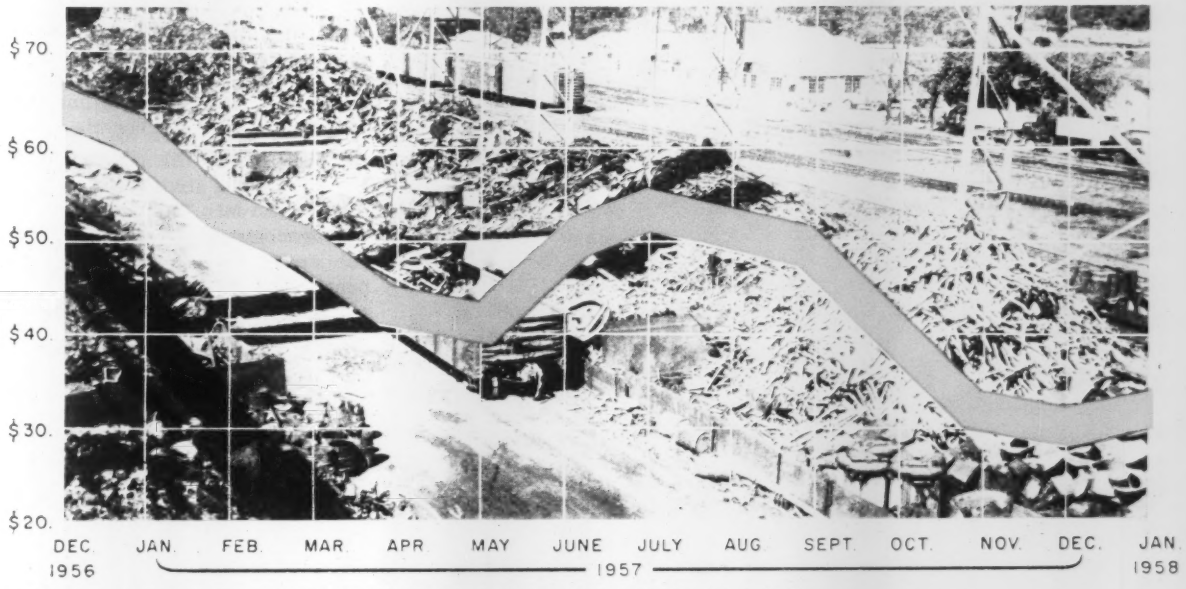
INLAND

Ledloy Steels

the world's most machinable

*Reg. Trade Mark

Steelmaking Scrap Price Composite Rising?



Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania. Compiled by STEEL.

Good Sign for Metalworking

Scrap prices, a barometer of business trends, turn up, hinting that the economic weather will improve. Scrapmen meeting in Miami Beach discuss ways to stabilize their industry

SCRAP PRICES may have hit bottom and are starting to climb. If so, the rebound presages better business for metalworking.

Barometer — Take a close look at the hill-and-valley trend line above. After scrap prices peaked in December, 1956, a drop started that preceded slightly slower metalworking volume in the first half. Scrap prices recovered in June and early July last year—but never to the previous December's high. Metalworking also recovered a few times during the first seven months. Scrap prices started a long decline in late July, which was reflected in a slide in metalworking volume that became obvious by September.

Usually, scrap prices move several months before metalworking sales change direction. In the week ended Jan. 22, STEEL's price composite hit $34.25, vs. the $33.33 level that has held for two weeks and the $32.77 average chalked up last month (see Page 125). If scrap prices have hit their low point, metalworking's recovery should start soon, too.

Agreement—Edwin C. Barringer thinks so. The executive vice president of the Institute of Scrap Iron & Steel Inc. told delegates to the association's annual meeting in Miami Beach, Fla., last week: "The period of digestion of the boom of 1954-56 is nearing an end. The turn upward will come quicker than many expect, and it may be as sharp as the downturn."

That would be good news for scrap, as hard hit economically as any segment of metalworking. Employment in the industry dropped from 48,000 last July 1 to 36,000 this month. Even with a recovery, consumption of scrap in 1958 won't match the 1957 figure, predicts H. B. McCoy, administrator of the Commerce Department's Business & Defense Services Administration.

Trends in Use — Consumption trends in iron and steel scrap are giving the whole industry plenty to think about. The scrap market's volatility and frequent high prices clash with the steel industry's long term planning. Result: Steelmakers are engineering a reduction in its dependence on purchased scrap.

How to meet that challenge and save the market for scrap was outlined by the institute president, Leonard H. Krieger, a Pittsburgh

scrapman who put his suggestion in this question:

Stock More—"Wouldn't our industry be better off to handle the full complement of material it's geared to handle, stocking more material on falling markets to sustain better price levels and creating reservoirs of material to meet the next pressure of rising operations?

"I fully believe we would handle more tonnage at a better average profit and that the range between the low and high price in any move would be narrower," Mr. Krieger opines.

This, he says, is stability, which the steel mills are looking for in their expansion plans.

Where's Financing?—"The obvious first question you will ask is 'Where will we get the money to stock scrap on the low side?'" Mr. Krieger points out. "There is no ready answer to this question," he admits. But the scrap institute's officers and directors are studying it.

The answer, Mr. Krieger suggests probably lies in making scrap "bankable"—making it something on which money could be borrowed.

Improved Quality—To help make scrap "bankable," he suggests that a lot of attention be given to quality. "If there is one single element that will contribute more than any other to create stability in our industry, it is uniform grading," he declares.

"I am confident that if the program of bankability is pushed, the answers will be found. After all, there is money to be made in financing scrap inventories, and with probably less risk than many people incur in their present finance ventures," Mr. Krieger says. "A few pilot operations, successfully launched, would set the pattern for full-scale financing."

Big Reservoir—Mr. Krieger says: "You will see the day when our dealers' stocks in time of low demand will be a reservoir of 6 million to 8 million tons, just as mill stocks are today."

The Canadian government is exploring means of improving the bankability of metals so the "machinery" of producing or collecting them does not break down during periods of low demand.

GE Automates 'Job Shop'

Small AC Motor & Generator Dept. cuts delivery time on special motors in half. Standardized components, flexible facilities, and automatic handling are keys

AN INVESTMENT of $7.5 million in plant modernization and product design is minimizing labor costs and speeding delivery for General Electric Co.'s Small AC Motor & Generator Dept., Schenectady, N. Y.

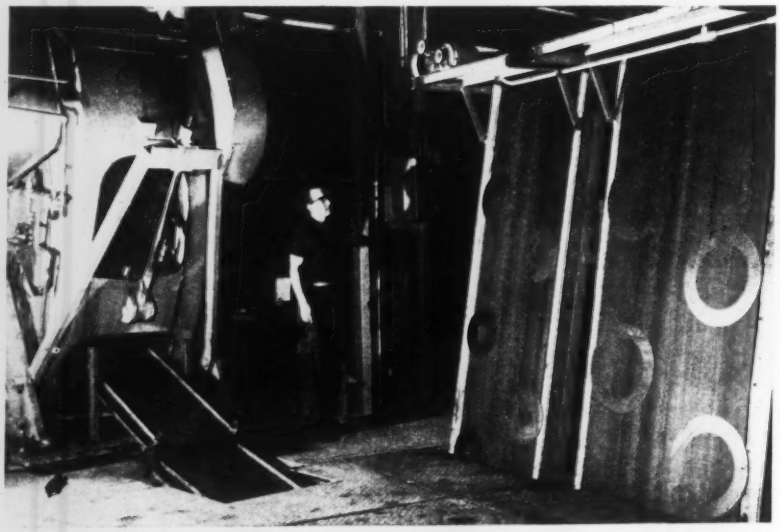
When GE moved its controls division to Virginia, Buildings 89, 85, and 81 at Schenectady were vacated. No. 85, which is between 89 and 81, houses manufacturing facilities for 7½ to 30 hp motors. The other two buildings make up a 230,000 sq ft, fully automated plant in which 40 to 125 hp motors are built.

Since less than one-third of the motors in the 40-125 class are standards, the plant operates along the lines of a job shop. But ingenuity of material flow and product design permits special motors to be efficiently mass-produced. Standardized components, flexible facilities, and automatic material handling are the keys.

How It Works—Components are machined in Building 89. Then a conveyor moves them through an outside trestle around the end of Building 85 into Building 81. The conveyor travels overhead to various dropoff points where components are picked off for assembly. (Separation of machining and assembly keeps cast iron dust out of the motors.)

At the front of Building 81, punch presses make rotor and stator stampings from 5-ton rolls of sheet steel. A vertical magnetic belt transports the stampings upstairs for further operations. Rotors and stators are then assembled into cores and fed into the annealing oven. After moving through its three chambers (preheat, anneal, and cool), they are tested, automatically loaded, and their outside diameters are turned to finish dimensions.

They travel through a "Parkerizing" process, have aluminum windings centrifugally cast, and



Vertical magnetic belts carry rotor and stator blanks at GE's new motor plant

are conveyed to the coil insertion area. Six insulation operations and testing follow. After a final baking, they go to the assembly machine (a unique facility which presses the stator into the frame with a force of 25 tons).

After vertical positioning of the rotor assembly into the stator and frame assembly, the finished motor is shunted into an area for resistance, impedance, high-potential, surge, and sonic testing.

Integration—All parts travel in the same flow during machining and assembly. Special motors have their own process areas to which they are detoured when their specifications call for something other than the next operation in the standard line.

Helpful Tricks—1. Tape control allows similar parts of different sizes to be machined on the same equipment by merely changing a tape. 2. Electrical steel is fed into a large Bliss press; the parts next go to a battery of three Niagara presses and on to a series of small presses with no manual handling. Belt conveyors do the job.

Prediction—James M. Crawford, vice president and general manager of the Motor & Generator Div., thinks industry sales of motors from 1 hp up will jump from $670 million to $870 million in the next three years.

Duquesne Works Adds Mills

U. S. Steel Corp.'s Duquesne Works is replacing old facilities with three new primary rolling mills—a high lift, blooming-slabbing mill with work rolls 46 in. in diameter, a 36 in. blooming mill, and a 21 in. billet mill.

Scheduled for 1959 operation, the equipment will be housed in five connected buildings which cover 2500 ft along the Monongahela River side of the plant.

Other new equipment will include ingot stripping facilities, seven banks of soaking pits, an automatic scarfing machine, shears and saws, seven batch type, slow cool furnaces, cranes and other handling equipment. The old primary mills will be dismantled. The addition will enable the Duquesne Works to roll slabs and expand its output of semifinished steel.

Automatic sequencing devices on this reversing rougher give...

No-Hands Control for Mill

A CARD programming system to take the human factor out of rolling has been installed on a reversing roughing mill at the Aliquippa (Pa.) Works of Jones & Laughlin Steel Corp. The rougher precedes a hot strip finishing mill.

When the roller presses the starting button, an IBM punch card initiates a complete slab rolling sequence on the Mesta mill.

Westinghouse Electric Corp., Pittsburgh, designed and installed the Prodac (for "programmed digital automatic control") system. It can handle speed and roll openings for up to nine passes on a single punched card.

Instructions—The card contains such information as: 1. Mill screwdown opening of 0 to 14 in. in 1/32-in. increments. 2. Edger adjustment opening of 6 to 44 in. in 1/16-in. increments. 3. Mill speed at 115, 300, 440, 715, 880, or 1100 fpm. 4. Edger speed, which is matched to mill speed but slower by a calculated percentage to take care of draft (amount of reduction per pass). 5. Rolling direction.

Radiation detectors warn the mill when the end of the strip is approaching and begin to slow it down. A load detector on the mill housing stops and reverses the mill the instant the strip or slab has cleared the rolls. Even guides, scalebreaker rolls, and water sprays are tied in to the automatic operation.

Freedom of Choice — Depending on the size of the next slab and the requirements at the strip mill, the roller can repeat the sequence on the next pass or change it with another punch card. There's one card for each different rolling schedule.

Card controlled mills are coming thick and fast these days. The next major step will be the application of the technique to other steel plant operations.

Even the open hearth shop is being seriously considered for punch card control.

Who Has Office Automation?

(Industry percentages)

TYPE OF BUSINESS	TYPE OF SYSTEM				
	Punched Card	Integrated Data Processing[1]	Electronic Data Processing[2] (Annual rental charge)		
			Less than $50,000	$50,000-$1 million	Over $1 million
All	33%	5%	0.15%	2%	0.4%
Advertising & Printing	20	2	1	—	—
Publishing	24	5	—	2	—
Banking	45	8	—	—	—
Insurance	62	3	—	9	1
Financial	31	4	—	3	—
Construction	5	—	—	1	—
Educational	16	4	—	1	—
Automotive Mfg.	51	4	—	2	—
Chemical Mfg.	45	11	1	3	1
Electrical Mfg.	55	14	—	9	2
Food, Tobacco, Drugs Mfg.	32	2	—	1	—
Machinery Mfg.) Light	47	10	—	5	2
Metal Products Mfg.) Heavy	35	8	1	1	—
Lumber & Paper Mfg.	28	6	—	1	—
Petroleum Products Mfg.	58	7	—	6	—
Textile & Leather Mfg.	36	7	—	1	—
Government Agencies	62	—	—	2	—
Public Utilities	55	3	—	4	1
Transportation	34	4	—	2	—
Wholesale Sales & Distrib.	22	6	—	1	—

Source: National Office Management Association.

1. Data are stored mechanically. 2. Data are stored magnetically or electronically. Blanks indicate less than 0.5 per cent.

Data Processing Gains

PRODUCERS of data processing equipment are stacking one record year on top of another. Their "metal memories" are being purchased by a wide variety of firms seeking to keep increasing volumes of paperwork from choking their profits.

Three years ago, International Business Machines Corp. had installed only 18 large electronic calculators, one medium-sized model, and 2200 small "brains." It now has over 150 large, 750 medium, and 3800 small systems in the field. The small models have an annual rental of under $25,000; the rental on large systems is over $350,000 annually; rentals on mediums cover an in-between area.

They'll Grow—Since the building block concept is used with the intermediate and large models, it's possible to start with a $40,000 system and add components to increase its applications until it reaches a $400,000-plus level.

One reason for the over-all growth is acceptance of data processing by smaller firms. A survey just completed by the National Office Management Association (NOMA) shows that 30 per cent of offices employing 26 to 100 have punched card equipment and 4 per cent have integrated data processing (IDP) equipment. IDP is defined as an automatic system that stores data mechanically. (For example, cards and tapes are used.)

Small firms find the equipment feasible for inventory, payroll, and accounting chores, engineering computations, and statistical work.

Size Helps — Applications for punched card equipment increase with office size. NOMA found that firms with less than 25 office workers average 3.6 applications, while offices with over 5000 employees average nine jobs.

The most popular duty for punched card installations is computing sales statistics; for IDP, order-invoice work; for electronic data processing systems (EDP), payrollwork and engineering computations. EDP systems store data magnetically or electronically.

Main Markets—Biggest users of punched card systems are government agencies, public utilities, and insurance companies. IDP is used most by electrical and chemical manufacturers. Those two groups, plus insurance firms, are the chief users of EDP.

Groups making least use of the equipment, according to NOMA, are construction, service, educational, retail sales and distribution firms.

Roadblocks—NOMA asked nonusers why they do not have data processing equipment. Their replies: 69 per cent had "too little paperwork to warrant it"; 6 per cent say "the equipment costs too much." A few companies reported these barriers: 1. Equipment wouldn't do their job. 2. Floor space was not available. 3. Required personnel were not available. 4. Installation costs were too high.

Will Buy More—Of firms which already have punched card installations, 45 per cent have more on order; 22 per cent of firms with IDP systems have more on order. Of companies using EDP: 17 per cent with small units are buying more; 23 per cent with medium units have ordered more; 38 per cent with large systems have more on order.

Cutting Labor Costs

Speakers at National Industrial Conference Board meeting suggest several ways to do it

THREE ways to trim fat off labor costs were suggested by a panel at a meeting of the National Industrial Conference Board:

1. Increase output per production wage dollar.
2. Analyze and re-evaluate white-collar salaries.
3. Make your medical department a cost reduction partner.

Bluecollar—Delegates were told that any firm can cut production wage costs 5 to 10 per cent. To do it, you must: 1. Know what the costs are. 2. Determine how each wage dollar is spent. 3. Obtain the co-operation of supervisors.

Saving $1000 in wage costs can equal the profit on additional sales of $50,000, or maintain profit if sales drop that much.

Whitecollar—American industry employs about 18 million office workers, a 52 per cent jump since 1947. During the same period, the gain in production workers was only 5 per cent, says John Holzbog, director of industrial relations, Otis Elevator Co. He says:

1. Examine each operation to see if it performs an essential function. If it doesn't, eliminate it.
2. Evaluate each job. Pay its holder an equitable sum.
3. Establish and use budgets.
4. Make sure the right people are in the right jobs.

Medical — Don't overlook the company medical department as a means of cutting labor costs, says A. D. R. Fraser, president of Rome Cable Co.

"Absenteeism is one of the greatest added costs of production. Some authorities estimate absenteeism due to sickness causes the loss of 500 million mandays per year.

"Since we started a medical department in 1947, absenteeism per employee has been cut from nine to four days per year. Lost time from occupational injuries has dropped to one-fifth of its former level and claims for workmen's compensation have been reduced to about 25 per cent of the former average."

Atomics: A $3 Billion Foreign Market

(For 1958-67 period)

Product	Potential Market (millions)
Power reactors & related equipment	$2000
Propulsion reactors	1000
Research reactors	30
Radioisotope & radiation applications	10
Engineering services	75
Total	3115

Estimated by Vitro Corp. of America, New York.

Atomics Aid Export Sales

NUCLEAR DEVELOPMENT will help take up the slack in export sales from the U. S. Vitro Corp. of America, a builder of nuclear reactors, estimates that the U. S. will sell more than $3 billion worth of nuclear goods and services to foreign nations in the next decade.

Explains Ralph L. Brown, vice president of Vitro International, an operating subsidiary of Vitro Corp.: Most overseas nations are now in the early phases of nuclear development. Some need nuclear power immediately but can't afford to take time to develop necessary technological capabilities. They must rely on U. S. knowhow and equipment to fill the gap.

What It Offers—U. S. firms have good reason for wanting to corner this lucrative market. It would help them get the experience they'll need to tackle American projects; it would meet U. S. responsibilities under the Atoms for Peace program; and, for some firms, it would redirect a down-trending sales curve.

Obstacles — Some stumbling blocks lie in the way. Britain's growing nuclear industry will offer stiff competition in many areas. Other progressive nations will turn to licensing to advance their own programs. The U. S. government still has to sign agreements with several nations that could become buyers of U. S. technology.

Optimism—"We are confident that American industry is equal to the challenge," says Mr. Brown. Vitro International was established only last month—proof of his optimism. The firm is currently engaged in the design and construction of three foreign projects — a nuclear test facility at Milan, Italy, a heavy water-fertilizer plant at Nangal, India, and a 150,000-kw power station near Anzio, Italy.

Opens Conveyor Plant

Stephens-Adamson Mfg. Co., Aurora, Ill., opened its new 40,000 sq ft manufacturing plant at Clarksdale, Miss., where it will fabricate components for conveyor systems. D. R. Dolan, former regional office manager, heads the operation.

New Motor Solves Problem

Speed is not a compromise: You can get exactly the one you need for the job. Another unusual feature: Water is circulated through the jacket of the variable speed unit

DEMANDS of the aircraft and missile industry have sparked the development of a motor-machine tool combination that handles a range of metals like aluminum, steel, and titanium on a production basis.

The variable speed, direct current motor operates at 50 to 6000 rpm. It permits the machining of a variety of metals by simply changing cutting tools and dialing the optimum spindle speed for maximum production and tool life. Another big feature of the spindle motor: It's water cooled.

First Installation—A 10-hp motor is being used on a tracer controlled, three dimensional profile milling machine. Motor design and development were the co-operative efforts of Allis-Chalmers Mfg. Co. and Ekstrom, Carlson & Co., which produced the milling machine.

Problem — Spindle speeds have been conventionally controlled through gearbox drives with 8 to 32 speed changes, but the method frequently led to complaints that the speeds obtainable were not correct for the work feed rates.

The new motor controls speed two ways, explains Vernon B. Honsinger, head of Allis-Chalmers' Norwood Works development lab: 1. Through a magnetic amplifier in the motor field for speeds of 1500 to 6000 rpm—constant horsepower is maintained. 2. Through armature voltage control in the 50 to 1500 rpm range — constant torque is maintained.

The outer frame of the motor serves as the supporting structure and as the outside shell of the water jacket. Water circulates through the jacket to and from a 55-gallon drum equipped with a small electric pump.

Extra Protection — Bearings on the motor are lubricated via an Alemite oil mist system. In addition to the conventional electric circuit protection devices, the motor is protected from overheating by flow, temperature, and pressure cutout switches in the water system.

Input voltage to the control panel is 3-phase, 440 volts.

Ekstrom, Carlson is making its profile milling machine in two sizes: 24 in. wide with 4 ft table travel and 24 in. wide with 10 ft table travel.

Chief features of the versatile equipment, says Harold Nelson, president, include: Tracer control in three dimensions and an optional swarf or twisting attachment. The attachment permits tilting of the cutting head 20 degrees either side of vertical through a single dimension tracer template. The machine is also equipped with a four-position depth stop for cavity or depth milling and is controlled by a 180-degree tracer valve which will repeat within 0.0005 in.

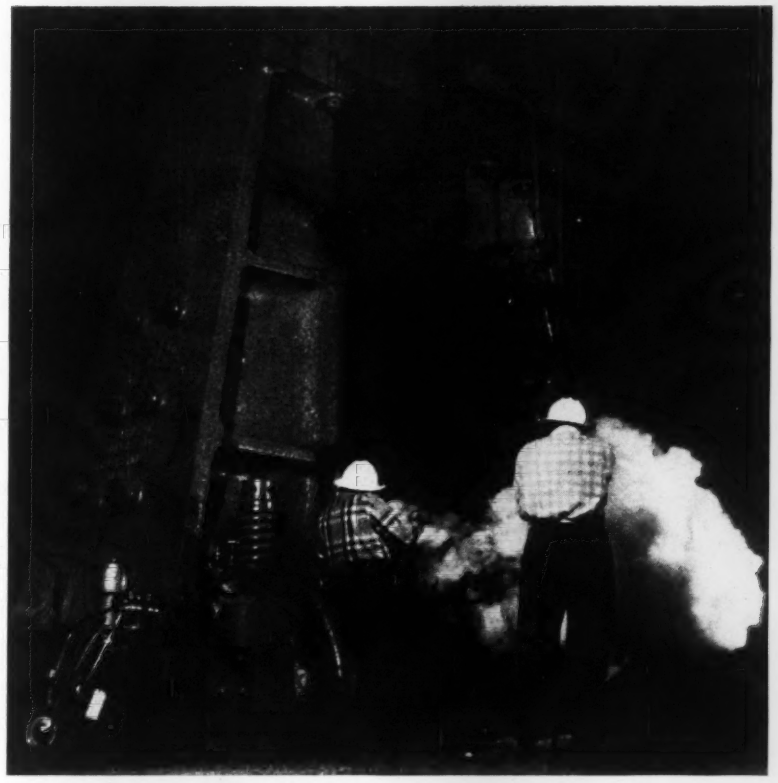
Radiolike Controls — A master pushbutton control station is mounted on the end of crossarm. This includes all operating buttons for tracing control and the potentiometers for setting spindle speeds. A pendant station is also provided for regular control of the machine by the operator.

Another modification is underway, says Mr. Nelson: A back gear will be used in connection with the new motor. Designed for use on a slab mill to work with the 4130 steel series, a spindle speed of 15 rpm at 240 horsepower will be obtainable. The tool will be 4 in. in diameter.

Three-dimensional tracer being used on aircraft forging with varying planes

Gulf States Adds Mill

Gulf States Tube Corp., Rosenberg, Tex., a subsidiary of Michigan Seamless Tube Corp., is building a 12,000 sq ft plant scheduled for completion in March. It will house a 12 stand, 3 roll reducing mill, a roll-down type furnace, and straightening, finishing, and coating equipment. The addition will allow the division to produce small diameter, hot finished seamless pipe.



Kropp Forge Co.'s 50,000-lb drop forge hammer

121 Years of Labor Peace

That's the record behind Kropp Forge Co., Chicago. Such a favorable climate has helped it to grow from a small job shop to a major producer of forgings

THE KROPP family has operated a forging business for 121 years without a strike or work stoppage. But that's only part of the feat: For a number of years, Kropp Forge Co., Chicago, has been dealing with four different unions.

The company has about 670 workers in Chicago and 80 in Rockford, Ill. Chicago workers are represented by the Independent Forge & Machine Workers, the Die Sinkers Conference, and the International Union of Operating Engineers (AFL). The Rockford union is the International Association of Bridge, Structural & Ornamental Iron Workers.

Philosophy—Raymond T. O'Keefe Jr., Kropp's executive vice president, explains that the company "has built its labor policies on the principle of fairness to employees, customers, and stockholders. Management is convinced that a proper balance between wage structure, selling price, and return to stockholders must be maintained if the business is to prosper."

Indoctrination — The new employee receives a booklet explaining the company's history, its product, industries served, employment and safety regulations, the Employees' Savings and Profit Sharing Fund (it's compulsory), and other information. Employees also receive a bimonthly four-page house organ, *The Village Blacksmith*. Supplementary activities include talks on the departmental level and occasional plant-wide meetings.

Fringe benefits include vacations, holiday pay, profit sharing, and insurance. Union contracts are usually on a one-year basis. Three provisions of the contract with the Independent Forge & Machine Workers are noteworthy: 1. Workers will strive for high quality workmanship and co-operate with management to that end. 2. The union bargaining committee will get a hearing before top management if a grievance is not adjusted via normal procedures. (If that doesn't work, arbitration is used.) 3. Slowdowns are outlawed.

The labor relations and personnel staff has three members. Thomas A. Meehan is labor relations manager. He reports directly to Mr. O'Keefe who determines company policy and advises management representatives during contract negotiations.

Outside Help — The company sends supervisors to the Victor L. Short three-session seminar at the Institute of Human Science, Chicago. "It develops them in the art of human engineering." They also take a followup course given by the Short organization. A highlight of the program is a test for personality rating and temperament classification. (It indicates whether enrollees are introverts, ambiverts, or extroverts.) Individuals also rate themselves. Composite averages are obtained from an appraisal by three associates. The program is used to place and upgrade supervisory personnel.

Long Drive Up—The Kropp family's experience with forging dates back to 1837 and a small water-powered shop in Annefors, Sweden, where Charles A. Kropp, founder of the Chicago firm, advanced from apprentice to head of the shop. In the late eighties, he came to America. In 1901, with three partners, he opened a job shop. It has evolved into a major source of quality forgings.

Ike's Economic Outlook: Is He Sincere?

SOURCES close to the White House are several degrees less optimistic about business in 1958 than official administration pronouncements. Example: While the President's economic report to Congress expresses firm confidence in the future, high advisers privately warn that a rash of wage increases in key industries will checkmate any recovery.

Concern is particularly expressed about the coming auto negotiations. Wage hikes which go beyond productivity increases could force prices back into their upward spiral of 1956-57 and deadlock employment uncomfortably below the maximum level sought through the Full Employment Act. Some sources view the rash of new orders from the Pentagon (STEEL, Jan. 20, p. 35) as a two-edged sword. They may act as an economic tonic, but they also may encourage unions to demand more. And industry may take rising backlogs as reason enough for not resisting union demands to the point of a strike.

The Council and the FRB

The President's report cites easier credit as one sign of economic recovery. Talk in Washington last week was of further aid to the economy through a reduction of bank reserve requirements. The moves have long been wanted by the President's Council of Economic Advisers, but they were held back by Federal Reserve Board demands for tighter money.

The council appears to be back in the fiscal-policy saddle. The President's report phrases it this way: "The decline in business activity need not be prolonged. Economic growth can be resumed without extended interruption."

While the FRB is shadowed by council policies, look for a more open fight between Ike's tight and easy money advisers next year. If the economic upturn does result in mostly inflationary gains, government controls on wages and prices are not entirely ruled out. The council is discussing "when" these days, although the members see no immediate need for them.

Warning to Labor and Management

Ike carefully places the blame for our industrial ills on both labor and management. He cites: 1. Price increases that are unwarranted by costs. 2. Attempts to recapture investment outlays too quickly. 3. Wage increases beyond productivity gains.

New Mineral Research Institute

The National Science Foundation reports the mineral industries are "actively exploring" the need for a Minerals Research Institute to conduct and sponsor basic research in earth science.

NSF believes foreign deposits and better technology in the exploitation of low grade domestic deposits can provide only "a temporary and partial solution" to our resource problems. Pointing out that more than 90 per cent of our metallic wealth has come from about 1000 square miles of territory, NSF says: "At the rate we are extracting minerals, we must locate another 1000 square miles for our needs."

Machine Tool Disposal Program

Official sources estimate about 11,000 government owned machine tools will be sold in 1958 and 12,000 in 1959. Considering the 300,000 tools now owned by Uncle Sam, such a disposal program is not regarded as too significant.

There is agitation to boost those figures. The Joint Committee on Defense Production reports the Pentagon is "reviewing its future military programs to determine what portion of its idle reserve (42,000 unassigned tools) will be required for specific production programs in case of an emergency."

Current war plans of the Joint Chiefs of Staff are reported to call for "encouraging" private industry to provide its own production tools for an emergency, as well as reducing our industrial reserve to "minimum" requirements. Full details of the new plans will be announced soon.

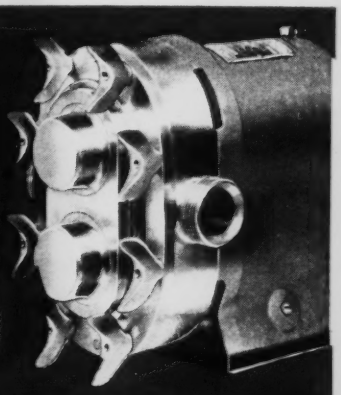
Holaday Gets Antimissile Missile Job

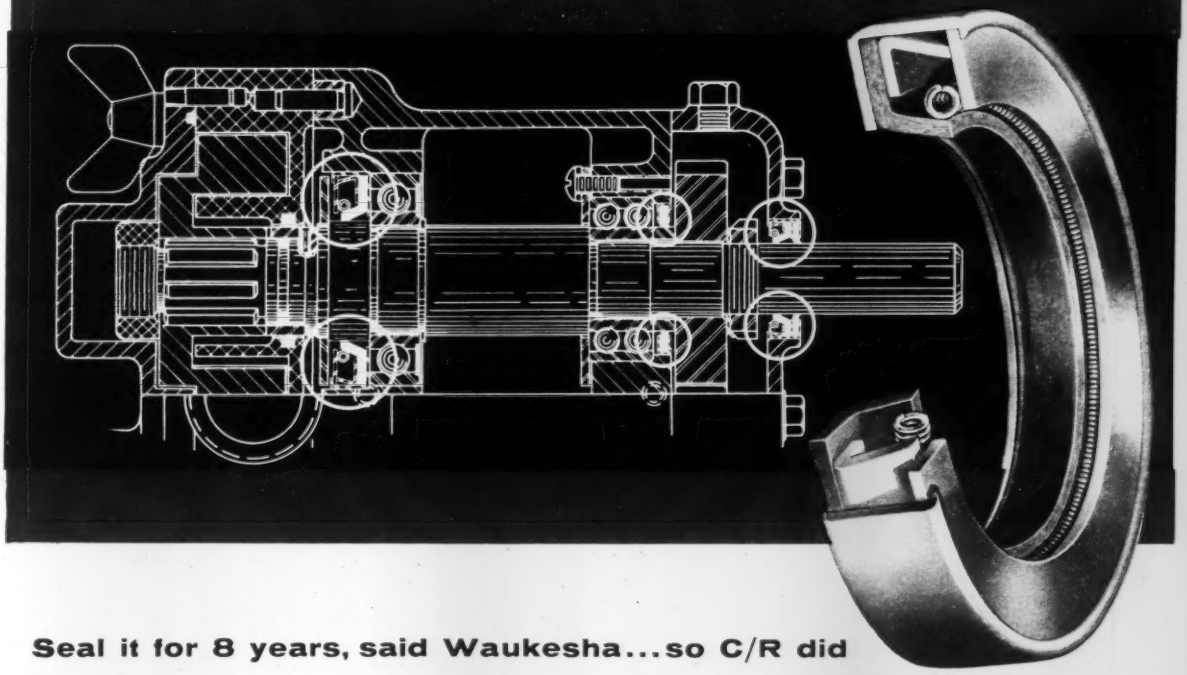
Missile boss William Holaday is the interim coordinator of Air Force and Army efforts to produce weapons which will detect and destroy enemy missiles. He'll go back to running the current missile programs when our space agency, the Advanced Research Projects Agency, gets off its launching pad, and finds a man willing to head it up. It's reported that Defense Secretary Neil McElroy has not been able to get an industry man of national stature to head ARPA. He remains reluctant to appoint a military personality.

AF's job is to detect enemy missiles; the Army's, to destroy them. It is not known if the Army will get anything like the $5 billion antimissile missile program it has been hoping for, but Army folks are generally satisfied to have their foot in the door.

Plans still call for space and antimissile missile facilities and personnel of the services to be turned over to ARPA eventually. The appointment of Mr. Holaday, however, promises to delay such a switch in defense organization. The appointment will last until Congress hammers out its own version of defense reorganization. Nothing new is expected from the White House.

WAUKESHA PUMP SEALS CHECKED OUT FOR 20,000 trouble-free hours





Seal it for 8 years, said Waukesha...so C/R did

"And, we might add, we have had very, very few instances of failure with C/R Oil Seals," says Mr. Gilbert R. Funk, Vice President, Pump Division of the Waukesha Foundry Co. Long service life is only one of the requirements met by the C/R Types P, G and A Oil Seals in this Waukesha Sanitary Pump. They must seal effectively eight hours a day, six days a week for eight years . . . at shaft speeds up to 750 r.p.m., with pump head pressures up to 150 p.s.i., and temperatures ranging from 0° to 220° F., depending on the food material pumped. They also must resist food acids, and the acids and alkalies in the commercial detergents used to cleanse and flush the pump daily. An added indication of C/R Oil Seal dependability in the Waukesha Sanitary Pump is the fact that it constantly must meet rigid 3-A Sanitary Standards for the Dairy and Food Industries.

If you have a sealing problem . . . equally critical . . . or simple . . . bring it to Chicago Rawhide. C/R engineers will help you select the correct oil seal for your application from stock . . . or cooperate with you on special designs.

More automobiles, farm and industrial machines rely on C/R Oil Seals than on any similar sealing device.

OIL SEAL C/R DIVISION

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Export Sales: Geon International Corp., Great Neck, New York.

Other C/R Products

Sirvene (synthetic rubber) molded pliable parts • Sirvis-Conpor mechanical leather cups, packings, boots • C/R Non-metallic Gears

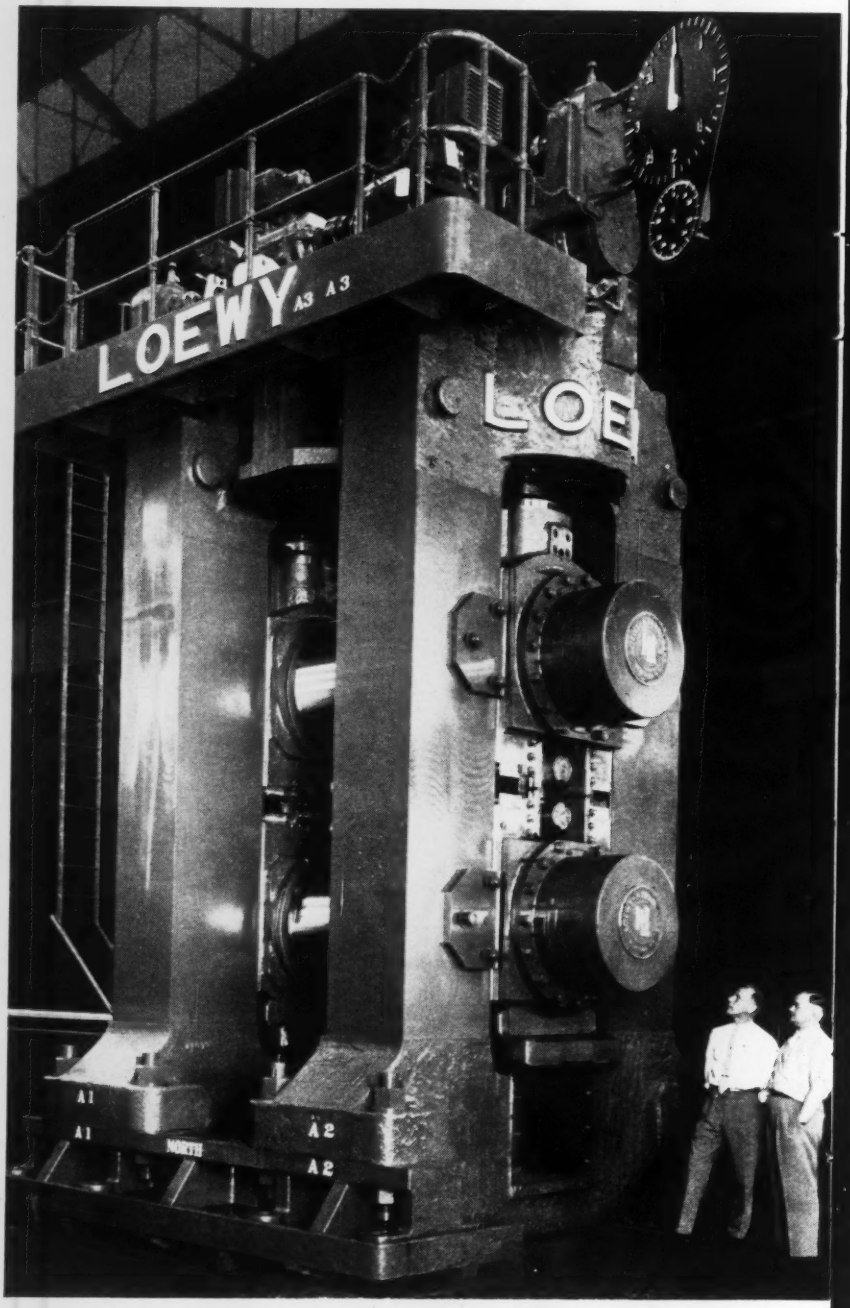
Loewy-Hydropress delivers powerful reversing mill within just 10 months of order date

Within only 10 months of the time it was given the go-ahead signal, Loewy-Hydropress has designed, built and delivered a rugged and powerful reversing mill for rolling slab ingots of particularly hard alloys.

The smooth operation and high efficiency of this unusual metal-forming installation can be attributed to Loewy's exceptional design ingenuity and wide engineering experience. But how was it possible to build it in record time, to supply it *ahead* of the promised delivery date? The answer is simple. As a division of Baldwin-Lima-Hamilton, Loewy-Hydropress has at its disposal the vast, yet smoothly integrated, resources of one of the nation's most diversified industrial organizations. B-L-H's unsurpassed facilities assure you of products that meet the most exacting quality requirements. And close coordination among all B-L-H divisions is the chief reason why Loewy-Hydropress can deliver your rolling mills faster.

Outstanding Loewy rolling mill installations for steel and nonferrous metals are operating in this country and abroad. Loewy designs, builds and installs rolling mills for hot and cold strip, sheet, foil, plate and wire rod; blooming mills, slabbing mills, rail and structural mills, billet mills, skelp mills, merchant mills, laboratory mills, specialty mills, and auxiliary equipment.

For detailed information, write us today, Dept. B-1.



Shown here on the erection floor is a 4-high rolling mill for newly developed hard alloys which was designed and built by Loewy-Hydropress.

Loewy-Hydropress Division

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Simonds Abrasive Co.

Abrasive Wheel Sales Ebb

But the decline will be slight and short-lived. Producers emphasize technological advances, up prices a little, and switch from direct selling to distributorships

SALES OF abrasive grinding wheels will decline slightly this year to an estimated $165 million (vs. $169 million in 1957). Main reason: Slower demand from most larger customers. Example: Production refinements in the auto industry have cut use of abrasive wheels per unit (less metal is removed by grinding). But applications are broadening in some other fields. Prices went up an average of 5.5 per cent last year, but not enough to cover higher costs.

Producers are trending away from direct selling. Distributors now market 50 to 60 per cent of the industry's volume. There are a few exceptions: Peninsular Div., Abrasive & Metal Products Co., Detroit, still distributes 85 per cent direct.

Technical Emphasis—"Engineering abrasive wheels for automatic and semiautomatic operations, using manmade diamonds in the wheels, and obtaining higher cutting speeds are prime interests of the industry's engineers," says Fred A. Upper, manager of product engineering for Carborundum Co.'s bonded abrasives division, Niagara Falls, N. Y. Other refinements being accented: Higher precision requirements, electrolytic grinding, new bonding agents, and new abrasive materials (particularly for grinding stainless steel).

Demand will stay high for concrete cutting wheels, because major users (the construction industry and producers of farm machinery, construction equipment, and transportation equipment, other than automotive) expect an active year. Carborundum is finding new applications in grinding and cutting ceramics and the newer metals (especially titanium and zirconium).

Prediction — Planning and marketing heads at Bay State Abrasive Products Co., Westboro, Mass., think industry volume in 1958 may reach $170 million. They don't look for 1958's first quarter to equal either the first or last quarters of 1957, but a spokesman says: "There is still much to be optimistic about."

The firm is doing development work on product design, abrasive grains, and bonds (vitrified, resinoid, and rubber).

Main markets for grinding wheels include the automotive industry, steel mills, foundries, and producers of machinery, engines, bearings, and aircraft. Norton Co., Worcester, Mass., reports that more steel mills are reverting to grinding billets before rolling. Reason: To reduce danger of cracking. Billets are prepared for rolling by removing the skin (scale), cleaning, and removing surface defects.

Other trends cited by Norton Co.: 1. Greater use of manufactured abrasives for barrel-finishing. 2. Greater use of loose abrasives in stone-cutting with wire saws. 3. More interest in ceramic tools. 4. More ceramic coating applications in the rocket and missile fields. 5. Unusually high demand for grinding wheels from the electronics industry. (Never before a large user, this growth re-

flects higher precision requirements.)

Simonds Abrasive Co., Philadelphia, expects dollar volume in 1958 to approximate 1957's. It looks for increased activity in the basic abrasives field. Peninsular reports improved wheel density and various filler combinations contribute to improved wheel performance.

Chicago Wheel & Mfg. Co., Chicago, estimates industry sales in '58 will total around $170 million. Arthur T. Dalton, vice president, says: "Much progress has been made with internal wheels in the development of new bonds and mounting methods. Widespread use of threaded shanks, eliminating the conventional wheel screw, considerably strengthens the wheel, giving longer life and higher speeds." New designs, bonds, and processes are being developed for offhand grinding with portable tools using depressed center wheels.

Growing Markets — Expanding uses for weldments increase sales of abrasives to finish the welds. The depressed center type of wheel is widely used on portable grinders. This makes for a lightweight, versatile tool that can rapidly remove excess weld, clean out channels and corners, and rough blend.

In making blades, buckets, and turbine rings for jet motors, it is necessary to grind radiuses and corners of serrations, grooves, and holes. Small abrasive wheels do the job. Form and cylindrical wheels are used on other jet engine parts.

In the manufacture of drills, abrasive wheels are used to grind grooves into the work after it has been allowed to harden.

Multiwheel Grinders—One set of wheels can perform several operations simultaneously. This method is employed to make transmission shafts, armature shafts, camshaft and crankshaft bearings.

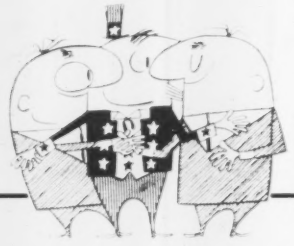
Semiautomatic machines are being used more for grinding stainless steel slabs, replacing hand operated, swing-frame grinders. Advantages: Higher productivity and less operator fatigue. Newly developed resinoid abrasive wheels withstand the high pressure between wheel and work. They're more efficient, too.

Despite Government Opposition...

Urge To Merge Continues...

SELLERS CAN:

1. **Obtain suitable successors if management lacks depth.**
2. **Convert personal assets to liquid form to pay inheritance taxes.**
3. **Salvage some assets of a failing firm.**
4. **Take advantage of a good offer.**
5. **Diversify personal holdings.**
6. **Obtain capital for expansion or product development.**



Combined efforts of Justice Department, Supreme Court, and FTC fail to stem merger tide. Look for Congress to pass Representative Celler's premerger notification bill

WITHIN a few days, the Federal Trade Commission will announce its 1957 count of business mergers —about 940 (vs. 905 in '56), the highest number reported in 27 years.

Washington will view the record with raised eyebrows because: 1. It happened in a year in which the Justice Department and the Federal Trade Commission were redoubling their efforts to annul corporate marriages (FTC was given an additional $1 million for the purpose). 2. It happened despite clear warnings to business that Justice and FTC were getting results.

To Rep. Emanuel Celler (D., N. Y.), the news that mergers are on the increase will be both alarming and gratifying. He'll be disturbed because "the rising tide of mergers . . . has played a key role in hastening the reduction of competition and concentrating economic power in the hands of industry superstructures." He'll be pleased because the report will dramatize the need for legislation he hopes to see passed during this session of Congress.

Prenotification — His bill (H.R. 7698) is an amendment to Section 7 of the Clayton Act. Major provisions:

- If the parties to a proposed merger have combined capital, surplus, and undivided profits exceeding $10 million, they must notify the attorney general and the FTC 60 days in advance of the transaction and furnish detailed information about their businesses.

for These Reasons:

BUYERS CAN:

1. **Acquire more capital to supply an expanded market.**
2. **Acquire capacity in a new area.**
3. **Acquire new products—sometimes complementing the old line, sometimes unrelated.**
4. **Acquire customers of the purchased company.**
5. **Acquire trademarks.**
6. **Acquire patents.**
7. **Acquire personnel and/or organization.**
8. **Invest idle capital.**
9. **Take advantage of a good offer.**
10. **Enter a new field—to diversify or because the old line is declining.**
11. **Acquire a tax loss carryover.**

Source: NAM.

• The FTC will be given the same authority that the Justice Department has: To seek an injunction to prevent consummation of a merger pending the issuance of a complaint and completion of an investigation.

Explains Need — Testifying last year before the House Judiciary Committee, Herbert Brownell Jr., then attorney general, stated that premerger notification would relieve the antitrust agencies of a burdensome task: Reviewing newspapers, business journals, financial periodicals, and manuals of investment for merger announcements.

It's important for FTC to have the authority to seek a preliminary court injunction against a merger, says Representative Celler, because "under present law, companies can obtain the benefits of a completed merger even though its legality has been challenged and notwithstanding the fact that, pending disposition of the complaint, the merger may cause the damage which the Celler-Kefauver Act (a 1950 amendment to the Clayton Act) was intended to prevent.

"In many mergers," he continues, "the acquired competitor is completely swallowed up, making it almost impossible to restore the previous competitive situation."

Merger-Busting — During 1957, the FTC and the Justice Department took vigorous steps to halt industrial concentration, and the Supreme Court made notable antitrust decisions:

• An FTC examiner ruled that Crown Zellerbach Corp., second largest U. S. papermaker, must sell St. Helens Pulp & Paper Co., a west coast competitor which it acquired in 1953. It was the government's first attempt to enforce unscrambling of corporate assets after they had been put together.

• The Supreme Court ruled that tax loss carryovers are not allowable unless the purchaser is in precisely the same line of business as the seller and has about the same corporate structure.

• The Justice Department filed a motion in U. S. District Court of Southern New York for a summary judgment against the proposed merger of Bethlehem Steel Corp. and Youngstown Sheet & Tube Co. (Judge Edward Weinfeld denied the motion, foiling the government's bid for an easy victory. He set the case for trial on Apr. 7.)

• The Supreme Court ruled that Du Pont's ownership of a 23 per cent stock interest in General Motors Corp. is illegal. It held that Section 7 of the Clayton Act applies to vertical as well as horizontal acquisitions and that the government may prosecute long after stock has been acquired.

Who's Afraid? — Against this background of increasing government opposition, the merger trend continues. Says a Justice Department lawyer: "The little fellows don't worry much about prosecution. If something good comes along, they just go ahead and merge. If opposed after the consummation, they claim that they can't unmix their assets."

Although there were more mergers in 1957 than in '56 or '55, the assets involved were probably no greater than those of firms that merged previously, says Duncan Price, FTC business economist. "Smaller companies are combining so that they can compete with the large ones. Often it's easier for them to merge than to refinance."

To Roy A. Foulke, vice president of Dun & Bradstreet Inc., the distinctive characteristic of the current surge of mergers is "conglomerate" acquisition. (There's no discernible relation between the business of the purchasing and the acquired firm.) "We find such bizarre and unique combinations as an anthracite coal mine acquiring a manufacturer of men's and boys' underwear."

Merger Aims—Charles M. Blake, assistant manager of the American Management Association's finance division, believes the percentage of mergers aimed at consolidation was greater in 1957 than in prior years. "The immediate postwar emphasis was on diversification, and perhaps it's still the objective in a majority of cases, but it's losing popularity."

MATCHLESS STEAM HOSE

Keeping a raging killer under control

Scalding steam is a powerful work-saving servant—but let it get out of hand and it can mean sudden death. Yet this valuable, though unruly demon is tamed by a hose that is *absolutely safe*—U. S. Matchless® Steam Hose. This hose cannot burst—even with steam pressures up to 200 pounds. After long, safe service—far longer than ordinary steam hose—the wall structure, instead of bursting, allows a trickle of steam to merely *leak* through—reducing the pressure and giving plenty of notice that a replacement is finally needed. Safety councils give U. S. Matchless their full approval.

U. S. Matchless Steam Hose is used in steam lines in every kind of industry. For such a husky hose, it is extremely flexible and easy to handle. The tube is made of specially compounded stock to provide high resistance to heat; the carcass is of braided mild steel wire to give outstanding strength, flexibility and ductility; a synthetic rubber cover resists heat, oil and weather.

U. S. Matchless Steam Hose is obtainable at any of the 28 "U. S." District Sales Offices, at selected distributors, or write us at Rockefeller Center, New York 20, N. Y.

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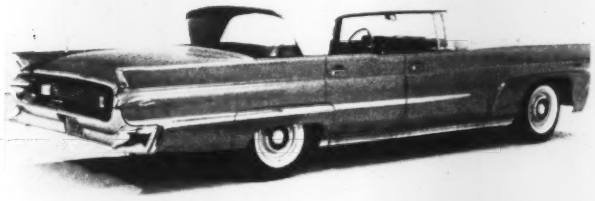

Slipping sales for Lincoln . . .

Sluggish volume for Mercury . . .

And Edsel's poor showing so far mean a tough job for Jim Nance as . . .

Ford Shifts Its Marketing

MARKETING has been shifted into high gear at Ford Motor Co. It has consolidated Mercury, Edsel, and Lincoln into a single M-E-L division, which will also market English Fords.

James J. Nance, former general manager of the Lincoln-Mercury Div., heads up M-E-L.

Consolidation — Mercury, Edsel, and Lincoln (including Continental) now have all manufacturing operations under a single head, although sales staffs and dealer groups still operate independently.

Although the consolidation follows Ford's long range plans to tie its car lines into more easily controlled groups, this merger might have been postponed were it not for a series of events that have made cost cutting imperative.

Stepped Up — Detroit faces a slow sales year which is complicated by the likelihood of a strike this spring. Costly layoffs already are in effect.

With sales down, the medium price market, which includes Mercury and Edsel, is in a bind.

Edsel—One Ford official has told STEEL: "Frankly, we couldn't have picked a worse year to bring out the Edsel!" About 35,000 have been sold since introduction in September, but 60,000 have been built. More than 11,000 of the sales came in the first 30 days. Since then, the sales rate has trended down. It's now estimated at around 5000 a month.

The story is that Edsel's top line, Citation, will be junked for the '59 model year—if not before. Several Ford dealers have said they're afraid they'll have to handle the Edsel if some dealers (now 1160) drop Edsel franchises.

Edsels are built on Ford and Mercury assembly lines. Many

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parts are interchangeable. With the M-E-L setup, it looks like Edsel production will be centered in Mercury plants to cut costs. The Ford Div. will become more autonomous.

Mercury—Joining forces should help Mercury, too. The Big M unit hasn't released any sales figures, but production is 40 per cent lower than it was a year ago.

Several staffmen say Mercury and Edsel purchasing and engineering groups are being reorganized and reduced. Some 1959 and 1960 tooling programs for both cars have been held up.

Lincoln—With Ford's luxury car in the M-E-L line-up, Mr. Nance will be able to keep close tabs on whether unitized construction is less costly than body and frame buildup. Some Lincoln engineers suspect it's not, and one new model cost man says Ford is wondering if it shouldn't switch back to frames when this body style runs out.

Sales figures aren't available, but Lincoln is below last year's levels. In addition, it faces tough competition from Chrysler's Imperial and possibly from Buick's luxury Limited which is new this year.

Imports—By including the English Fords in Mr. Nance's stable, Ford figures it can sell at least 40,000 of the economy imports in '58.

In 1957, the company built just under 1.9 million cars. Only 367,300 were Mercurys, Edsels, and Lincolns. The company hopes it can increase M-E-L's share this year because Detroit's consensus is that the Ford Div. won't outsell Chevrolet in 1958.

Mr. Nance's job shapes up as autodom's king-size challenge of the year.

SAE Talks Unit Body

Unitized construction was a popular subject of corridor conversation at the Society of Automotive Engineers' annual meeting at Detroit.

Just a few months ago, the talk was Chrysler definitely wanted unit bodies for 1960 cars. Now comes word the company may hold off to save money. If it does, the industry may not bring out another unit body until 1963—or later.

A Lincoln cost estimator reports: "It looks cheaper to start, but by the time you add enough deadening material to cut down the sound, costs are 4 to 7 per cent higher than those of regular frame construction. The deadening also adds 500 lb or more to over-all weight!"

Corridor informants also say Ford has costed a unit body for 1961 but won't go with it because changeover costs would be prohibitive. An earlier report says Ford would have to spend $750 million just to change conveyors.

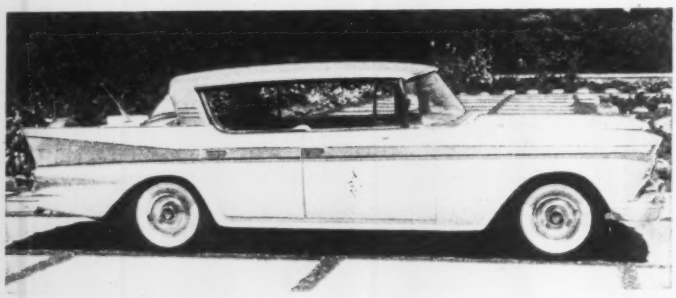
U. S. Auto Output

Passenger Only

	1957	1956
January	642,089	612,078
February	571,098	555,596
March	578,826	575,260
April	549,239	547,617
May	531,365	471,673
June	500,271	430,373
July	495,629	448,876
August	524,354	402,575
September	284,265	190,726
October	327,362	389,061
November	578,601	580,803
December	534,716	597,224
Totals	6,107,815	5,801,862

Week Ended	1957	1956
Dec. 21	140,447	154,832
Dec. 28	79,945	99,577
	1958	1957
Jan. 4	76,653	91,130
Jan. 11	120,140	147,129
Jan. 18	109,571†	145,761
Jan. 25	112,000*	145,191

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.



STEEL Tests Rambler Ambassador

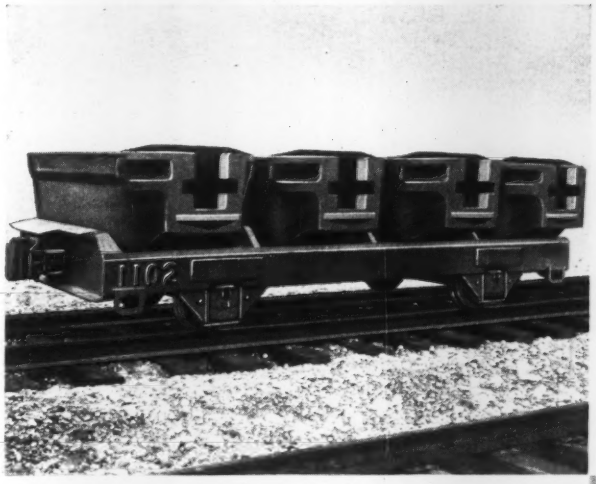
We've been driving American Motors' Rambler Ambassador and find it offers fast pickup and a smooth ride, but gas consumption is little better than average.

The Ambassador is AMC's biggest job. It's 200 in. long and built on a 117 in. wheelbase, compared with the 108 in. wheelbase of the Rambler Rebel. Height is 57.6 in. and the car weighs 3475 lb. Advertised delivered price, minus accessories, is $2822.

The model we were driving is powered by AMC's V-8 engine which has a 327 cu in. displacement, 9.7:1 compression ratio, and turns out 270 hp at 4700 rpm. Torque rating is 360 at 2600 rpm. The car has AMC's Flash-O-Matic automatic transmission, with pushbutton selector, power brakes, and power steering.

Cornering ability is adequate. Up to 35 mph, the Ambassador takes corners fairly flat, and there's no tendency to slide out at the rear.

Irksome items were loose doors which rattle. We hear this is typical; it looks like the center posts can stand more strengthening. The gas filler pipe is too small and has no air vent. Three gas station attendants waxed hot over this.



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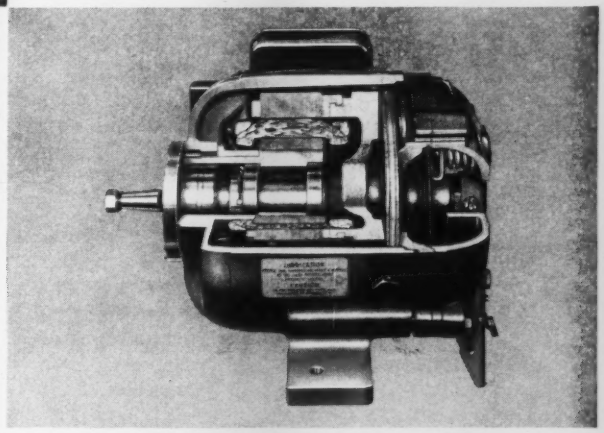
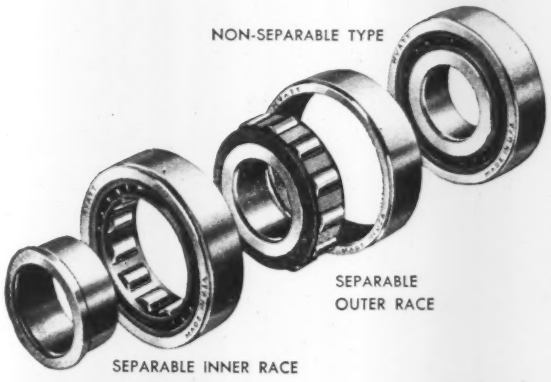
the more you need HYATTS . . . because nothing can compare with the cylindrical roller bearing for rugged, load-carrying capacity and continuous operation under adverse conditions. That's why leading steel mills specify HYATT Hy-Rolls for applications like these charging cars.

THE HIGHER THE SPEED...

the more you need HYATTS . . . because their internal clearances are stringently controlled for smoother operation. Built of the finest steels, HYATT Hy-Rolls operate with peak efficiency at high speeds as in this non-ventilated, continuous-duty textile loom motor.



THE MORE YOU NEED *Cylindrical* HY-ROLL BEARINGS



Today, as new industrial designs require heavier loads and higher speeds crammed into smaller housings, engineers are turning to HYATT Roller Bearings, America's most complete line of cylindrical roller bearings. They find their problems are solved quickly with bearings like the shouldered-race HYATT Hy-Roll that will handle heavy radial loads while taking a surprising amount of thrust. Contact your nearest HYATT Sales Engineer for recommendations—You'll find him a mighty big help! Hyatt Bearings Division, General Motors Corporation, Harrison, N.J.; Pittsburgh; Detroit; Chicago; Oakland, California.

THE RECOGNIZED LEADER IN CYLINDRICAL BEARINGS

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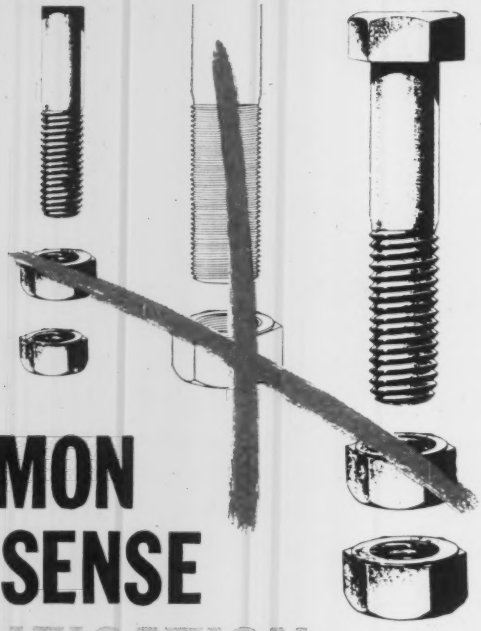
(Advertisement)

ECONOMIC FACTS ON FASTENERS



COMMON SENSE SIMPLIFICATION CUTS INVENTORY

● Reduce fastener inventory by simplifying usage requirements

● Lower your stock handling and purchasing costs, too

To take full economic advantage of "standard" fasteners, standardize their *usage*, too. The fewer types and sizes you can get along with, the lower your buying, stock handling and even assembly costs will be.

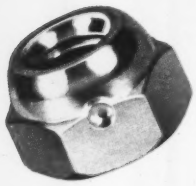
Case history: At one plant, the man tackling the job found more than 23,000 fastener items in inventory. Without need to consult anyone, he eliminated 1700 items immediately. With study, he figures to cut the rest in half.

Some suggestions: (1) Stock *only* one pattern of nut, not two or more, for each size bolt. (2) Use coarse threads almost exclusively; fine threads are seldom necessary. (3) Eliminate as many bolt lengths and diameters as feasible. Change a minor specification rather than add an in-between size. (4) Settle on fewer materials. Two grades of steel satisfy most strength needs. (5) Specify fewer head styles for bolts and screws.

Much simplification can be done by common sense alone; much *more* with the help of a fastener engineer. Ask the RB&W Fastener Man to show you. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, New York.

R B&W
113th year

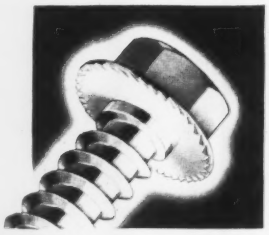
Plants at: Port Chester, N. Y.; Coraopolis, Pa.; Rock Falls, Ill.; Los Angeles, Calif. **Additional sales offices at:** Ardmore (Phila.), Pa.; Pittsburgh; Detroit; Chicago; Dallas; San Francisco. **Sales agents at:** Milwaukee; New Orleans; Denver; Fargo. **Distributors from coast to coast.**



Staked acorn nuts lock securely

Staking opposite sides of these RB&W acorn nuts deforms threads for a positive grip. It also puts middle of nut slightly out-of-round, for a spring tension locking effect. They're designed for applications such as outdoor furniture, where anchoring fasteners is more important than solid seating. Available in aluminum, steel, silicon bronze.

These all-metal nuts can also be furnished in double chamfered style. Since they lock with their middle threads, they can be turned onto screw from *either* side.



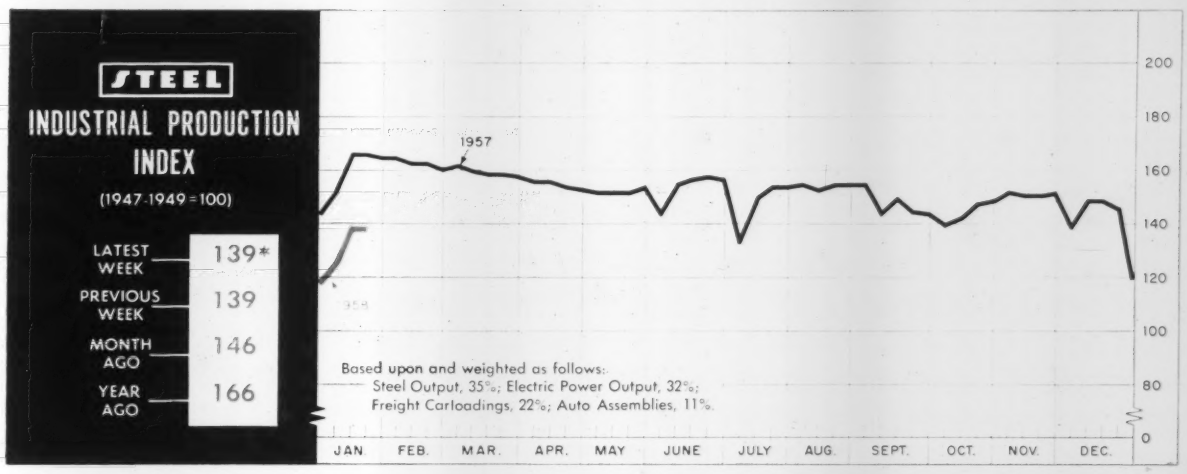
Tapping screws that lock into place

RB&W offers tapping screws with Spin-Lock® design. Hardened teeth on periphery of head lock into seat when screw is tightened. They resist backing off from vibration or thermal expansion and contraction.

In one case, continual heating and cooling had caused handle screws on certain flatirons to loosen. Every type tried failed to stay tight under these conditions, until RB&W's unique Spin-Lock tapping screws were installed. That did it.

Spin-Lock screws are available with flat heads or hex heads, and are reusable. Send for bulletin.

RB&W FASTENERS—STRONG POINT OF ANY ASSEMBLY



*Week ended Jan. 18.

Recession Nears Bottom, Say Economists

THE bottom of the recession is in sight: That's the consensus of some of the nation's outstanding economists.

The biggest part of the cutback took place in the fourth quarter, and conditions are not likely to get much worse, the experts told STEEL. But they could not agree on the timing of an upturn. In capsule form, here is what they see:

Banker—David Elliott, vice president of the Cleveland Trust Co., Cleveland, does not feel that the downcurve is over, but he thinks the sharp drop in the fourth quarter shortened the duration of the recession. Homebuilding, local and state governmental spending, and the start of more federal spending are beginning to apply upward pressure, but he doubts that it will be enough to turn the tide much before the fourth quarter.

Builder—Thomas S. Holden, vice chairman of F. W. Dodge Corp., New York, thinks the bottom is fairly close. Construction prospects in the near future are good, with some pickup in housing. The general economy will lag a little, with a further slight drop in the FRB index. But the upturn should come in the third quarter—maybe sooner.

Educator — Richard A. Lester, professor of economics at Princeton University, Princeton, N. J., feels that the recession is worse than the 1949 and 1953-54 versions because it is affecting more segments of the economy and is extending to foreign trade. The bottom has not been hit, and the next three months will probably look pretty black. Depending on how much money the government pours into defense and how soon, the turn could come in the fourth quarter—possibly the third.

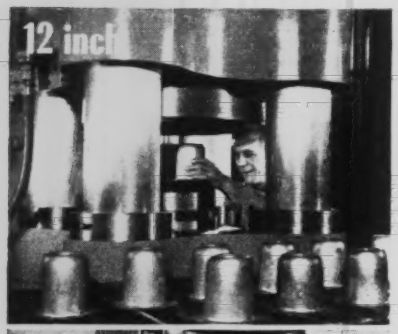
Investment Counselor — Lewis Schellbach, vice president and economist, Standard & Poor's, New York, feels the bottom will come this quarter. Gross national prod-

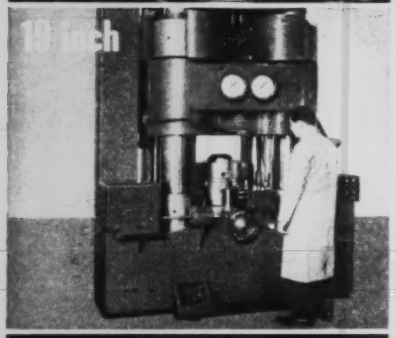
BAROMETERS OF BUSINESS

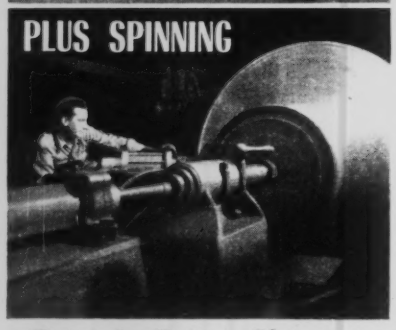
	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,500[1]	1,538	2,472
Electric Power Distributed (million kw-hr)	12,600[1]	12,506	12,556
Bituminous Coal Output (1000 tons)	8,705[1]	6,980	10,250
Crude Oil Production (daily avg.—1000 bbl)	6,825[1]	6,849	7,431
Construction Volume (*ENR*—millions)	$219.9	$171.0	$335.0
Auto, Truck Output, U. S., Canada (*Ward's*)	135,081[1]	146,025	177,778
TRADE			
Freight Carloadings (1000 Cars)	558[1]	569	657
Business Failures (Dun & Bradstreet)	324	203	256
Currency in Circulation (millions)[3]	$31,207	$31,553	$31,108
Dept. Store Sales (changes from year ago)[3]	+1%	+2%	+3%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$23,302	$25,630	$22,592
Federal Gross Debt (billions)	$274.5	$274.6	$276.0
Bond Volume, NYSE (millions)	$25.6	$24.7	$23.0
Stocks Sales, NYSE (thousands of shares)	12,098	11,067	11,504
Loans and Investments (billions)[4]	$87.7	$89.0	$86.2
U. S. Govt. Obligations Held (billions)[4]	$26.1	$26.4	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	225.92
STEEL's Nonferrous Metal Price Index[6]	199.9	201.2	251.9
All Commodities[7]	118.7	118.7	116.7
Commodities Other than Farm & Foods[7]	125.9	126.0	124.9

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

HYDROFORM JOB SHOP







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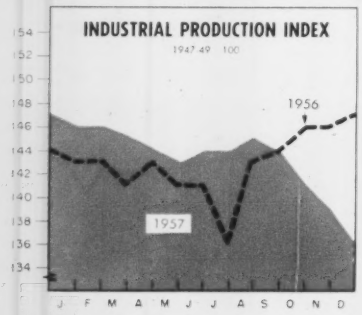
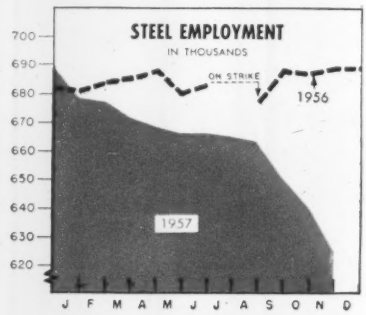
THE BUSINESS TREND





(Seasonally Adjusted)

	Total Production 1957	Total Production 1956	Primary Metals 1957	Primary Metals 1956	Metal Fabricating 1957	Metal Fabricating 1956
Jan.	146	143	144	148	180	170
Feb.	146	143	143	146	180	168
Mar.	145	141	137	145	179	167
Apr.	144	143	136	146	176	170
May	143	141	132	141	175	167
June	144	141	132	136	177	168
July	144	136	133	69	177	169
Aug.	145	143	136	125	177	172
Sept.	144	144	131	148	174	174
Oct.	141	146	128	147	168	176
Nov.	139	146	121	146	169	180
Dec.	136*	147	111*	145	164*	183
Avg	143	143	132	137	175	172

Federal Reserve Board. *Preliminary.
Charts copyright, 1958, STEEL.

	Employment in Thousands 1957	Employment in Thousands 1956	Payroll in Millions 1957	Payroll in Millions 1956
Jan.	678	681	$360.4	$329.1
Feb.	677	684	327.5	317.3
Mar.	671	685	344.2	338.1
Apr.	668	688	331.5	326.7
May	666	680	338.0	333.6
June	666	683	324.8	332.4
July	665	n.a.	334.6	n.a.
Aug.	663	677	343.7	300.9
Sept.	651	688	330.1	339.0
Oct.	640	687	345.6	358.9
Nov.	626	689	316.3	346.0
Dec.	...	689	...	347.2

n.a.—not available because of strike.
American Iron & Steel Institute.

uct will begin to rise in the second quarter and carry on through 1958. The FRB index will hit its low in February or March and begin a slight rise. But it will not be enough to raise the 1958 average to much more than 137.

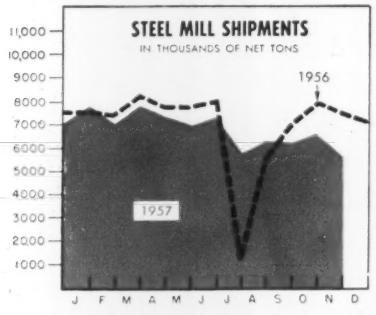
Steelman — William P. Carlin, economist for Republic Steel Corp., Cleveland, feels the steam has gone out of the recession, although the bottom has not been reached. From now on, the decline will be a gradual easing off, compared with the sudden drop in the fourth quarter. As for the steel industry, which has been more depressed than the general economy because of inventory liquidation, Mr. Carlin believes the bottom will be felt in this quarter at close to present levels. There may be some seasonal slackening in the third quarter, but the fourth period should see the industry on a plane with the rest of the economy. At that time, consumption and production of steel should be in normal relationship.

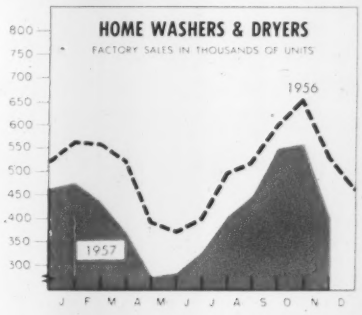
December Cutback Severe

Both employment and production figures for December show the extent to which the economy slacked off during the fourth quarter. At mid-December, employment had fallen to 64.4 million from 64.9 million in November. Despite the decline, the number of employed was nearly the same as it was in December, 1956. Unemployment rose by nearly 200,000 to 3.4 million last month, reaching the highest seasonally adjusted level in three years.

Manufacturing employment declined by nearly 250,000, with nondurable goods accounting for more than half the loss. In turn, the major metalworking industries (primary metals, fabricated metal products, nonelectrical machinery, electrical machinery, and transportation equipment) accounted for 89,000 of that. The steel mill cutbacks can be seen above.

Industrial production, as measured by the Federal Reserve Board, dropped to 136 per cent of the 1947-49 base period last month. It was at that level in July, 1956, when practically the whole steel industry was tied up by a strike. Prior to that, the index last registered 136 in April, 1955, when the economy was on the upswing after the 1953-54 recession. All segments of the index were down, but primary metals were off more than





	Net Tons		
	1957	1956	1955
Jan.	7,809,451	7,587,870	6,009,958
Feb.	7,066,732	7,468,393	6,119,900
Mar.	7,821,616	8,255,824	7,268,795
Apr.	7,349,752	7,783,873	7,279,321
May	6,972,091	7,764,776	7,540,889
June	7,284,616	8,077,805	7,770,213
July	5,877,133	1,288,988	6,250,597
Aug.	6,229,853	5,539,915	7,053,615
Sept.	6,171,674	7,058,028	7,378,247
Oct.	6,550,690	7,930,957	7,216,821
Nov.	5,606,018	7,431,136	7,247,994
Dec.	.....	7,064,093	7,580,943

American Iron & Steel Institute.

	Washers		Dryers	
	1957	1956	1957	1956
Jan.	331,314	393,717	144,621	166,243
Feb.	319,580	405,631	114,517	148,522
Mar.	286,205	405,744	83,668	113,031
Apr.	230,675	324,238	42,850	64,923
May	254,195	315,249	31,572	55,330
June	282,289	340,235	46,783	58,441
July	335,139	380,172	70,011	117,548
Aug.	329,046	373,925	116,601	144,537
Sept.	384,299	402,631	164,468	192,724
Oct.	369,487	439,049	185,772	196,569
Nov.	260,460	357,935	141,663	170,529
Dec.	.....	298,368	.....	162,953
Totals	.....	4,447,254	.....	1,601,710

American Home Laundry Mfrs. Assn.

any other durable goods segment. (See table, Page 56.) Despite a decline of 3 percentage points from the November level, the fabricated metal products segment of the index remained close to the year-ago level of 141.

Last Year Was the Best

Productionwise, 1957 as a whole measured up to any year in our history. The FRB index average was 143 in both 1956 and 1957. But the trend at yearend was up in 1956 and down in 1957. The First National City Bank of New York explains it this way:

"The disappointed Christmas hopes of retailers, despite good sales, typify much of 1957. All too often the year's results fell short of expectations. People who expected a fall pickup in consumer buying, a further stretchout of record plant and equipment spending, or a revival of business ordering found that they had indulged in wishful thinking. As a result, and because it ended in a downtrend, 1957 may not get as much credit as it deserved for being a good business year. On the record, it was probably the best year in the nation's history."

Builders Still Optimistic

Despite the disappointing level of contract awards for over a year, construction industry officials still expect 1958 to be one of the best on record. According to *Engineering News-Record*, heavy construction contracts for the first three weeks of 1958 are 37 per cent beneath the total of the year-ago period, which in turn lagged behind the period in record-setting 1956.

But Harold R. Berlin, vice president of Johns-Manville Corp., predicts that 1958 construction expenditures will reach a record $66.7 billion, including $22 billion in home repair and modernization. This would exceed the 1957 record by $500 million.

And a poll of the members of the National Constructors Association revealed that they expect 1958 to be the second or third best year for industrial construction. Because of the long leadtime involved in the construction of steel mills, chemical plants, powerplants, and other heavy engineering projects, the downturn in capital spending which began in '57's fourth quarter will not be felt fully until later this year.

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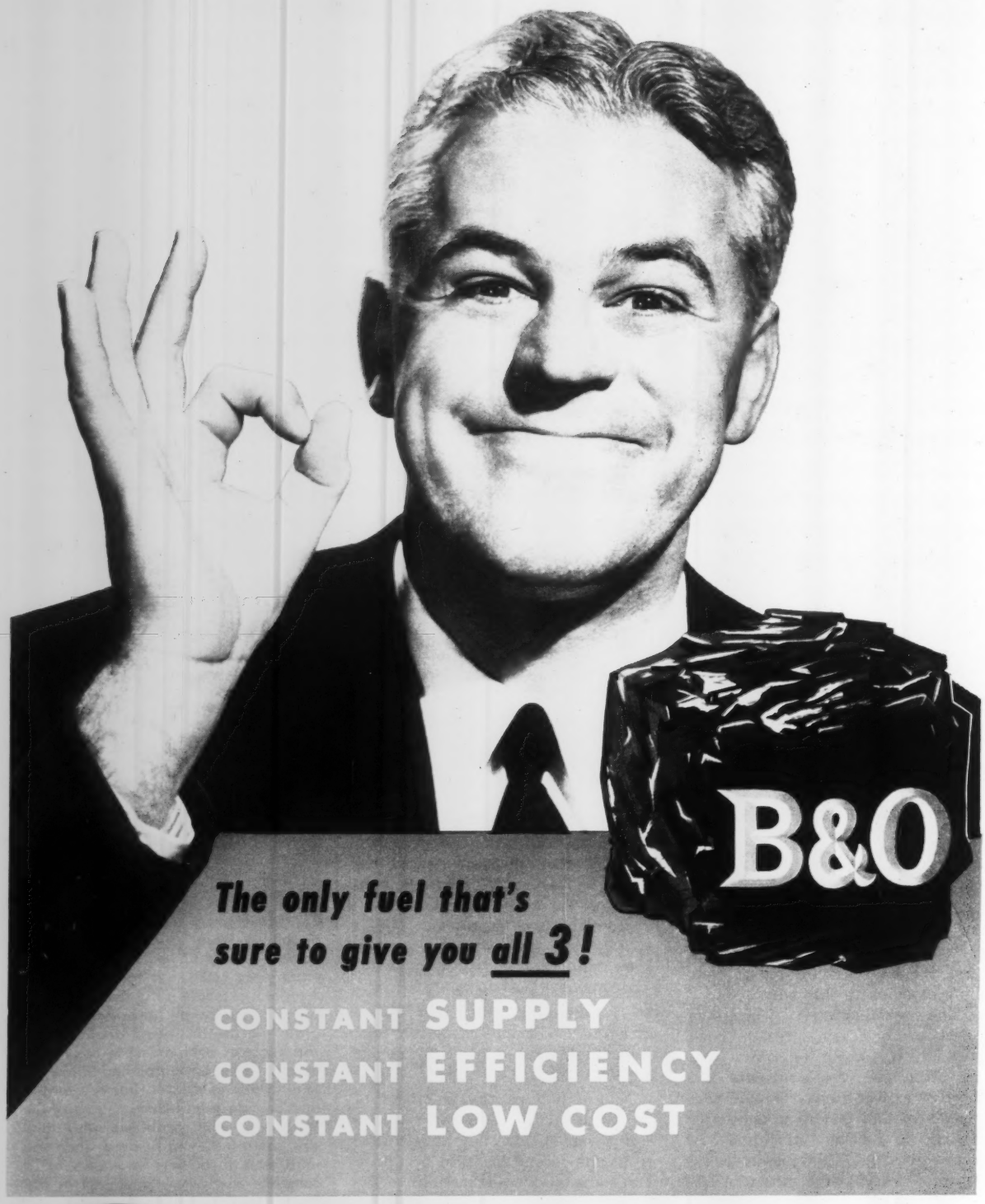

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Madison Industries post

JOHN F. WILSON
Metals & Controls v. p.

J. FRANK FORSTER
Vickers president

FRED W. ELLIOTT
Porter Company v. p.

Earl L. Prais was named factory manager, **Madison Industries Inc.**, Muskegon, Mich. He was factory manager with Liquid Carbonic Inc. He previously served as plant superintendent for Rheem Mfg. Co. in Chicago and as plant manager of its Canadian operation.

John F. Wilson was elected vice president-sales, **Metals & Controls Corp.**, Attleboro, Mass. He was general manager of marketing. Mr. Wilson joined the company in March. He was previously general sales manager, Cleveland Welding Div., American Machine & Foundry Co.

David T. Sicklesteel was appointed to the new post of manager of the Detroit office of **Warner Automotive Div.**, Borg-Warner Corp. He was manager, industrial sales and engineering, for Long Mfg. Div.

Charles W. Selover was named manager of purchases, **Hooker Electrochemical Co.**, for plants at Niagara Falls, N. Y., and North Tonawanda, N. Y. He was purchasing agent for raw materials.

William C. Ridge was elected vice president-production, **John A. Roebling's Sons Corp.**, Trenton, N. J., subsidiary of Colorado Fuel & Iron Corp. Mr. Ridge was works manager.

Louis F. Rosing succeeds **William W. Leffler**, retired, as superintendent of **Republic Steel Corp.'s** Canton, Ohio, heat treat and bar finish departments. Mr. Rosing was assistant superintendent.

J. Frank Forster was elected president, **Vickers Inc.**, Detroit, a division of Sperry Rand Corp. He succeeds **Kenneth R. Herman**, elected to a new office, that of executive vice president of Sperry Rand, in charge of the Remington Rand group of divisions. The Sperry group, which includes Vickers, is under **Carl G. Holschuh**, another newly elected executive vice president. Mr. Forster was executive vice president of Vickers.

Herbert C. Clough was elected president and treasurer, **Federal Gear Inc.**, Cleveland. Previously vice president, he succeeds his father, the late **F. C. Clough. Richard A. Whall** was elected vice president-sales. He was sales manager. **Dean Mills** was promoted from assistant purchasing agent to purchasing agent.

A. D. Dauch was appointed vice president-foreign sales for **Salem-Brosius Inc.**, Pittsburgh. **W. T. Bosworth** was named sales manager; **F. C. Frame**, assistant sales manager.

Edgar P. Dunlaevy was elected executive vice president, **Phelps Dodge Copper Products Corp.**, New York; **S. Allan Jacobs**, president of the Inca Manufacturing Div., Ft. Wayne, Ind. **John J. Conlon, William K. Dunbar Jr.**, and **Earle A. Mitchell** were elected vice presidents. **Charles F. Moody** was named works manager, Habirshaw Cable & Wire Div., Yonkers, N. Y., and **Lewis F. Buckman**, works manager, Bayway Div., Elizabeth, N. J.

Fred W. Elliott was elected a vice president of **H. K. Porter Company Inc.**, Pittsburgh. He was assistant to the president. Mr. Elliott joined Porter in 1956 after association with Pennsylvania Industrial Corp. Formerly he was with Battelle Memorial Institute, Columbus, Ohio.

A. C. Kohnfelder was made chief engineer, **Pennsylvania Engineering Corp.**, New Castle, Pa. He succeeds **Harry L. McFeaters**, who last year was elected vice president-engineering.

J. L. Sussman was named president, **Strip & Wire Corp.**, Brooklyn, N. Y. At the same time, Mr. Sussman, who heads Metals & Alloys Co., New York, has acquired the plant facilities formerly owned and operated by Steel Rolling Co., Brooklyn.

John A. Wettergreen joined **Marion Power Shovel Co.**, Marion, Ohio, division of Universal Marion Corp., as manufacturing vice president and general works manager. He was vice president-manufacturing for Bucyrus-Erie Co.

Edgar F. Dunn was named sales manager for **Whitehead Metal Products Inc.** at Buffalo.

At U. S. Steel Corp.'s **Fairless Works**, Morrisville, Pa., **Thomas D. Clifford** was made superintendent of the rolling division to succeed **Theodore J. Koenig**, who was promoted to assistant general superintendent, Homestead Works. **Walter E. Banner** assumes Mr.

PAUL W. WYCKOFF
Airtemp v. p.-eng.

HAROLD E. BERG
Republic chief eng.-Chicago

ERNEST E. BRAYSHAW
Keystone Steel & Wire post

Clifford's position of superintendent of the 45 and 80 in. mills.

Paul W. Wyckoff was named vice president-engineering for **Airtemp Div.**, Dayton, Ohio, Chrysler Corp. He was chief engineer.

Harold E. Berg was named chief engineer at **Republic Steel Corp's** South Chicago, Ill., steel plant. He succeeds **C. W. Bruce,** now chief engineer for Republic's steel plants, Cleveland. Mr. Berg was assistant chief engineer, Chicago district.

John Roach, chief engineer, was appointed vice president-production and development, **Hodag Chemical Corp.,** Chicago.

Howard W. Stephens was appointed vice president and treasurer of the recently formed **Berry Steel Corp.,** Kenilworth, N. J. He was assistant secretary-treasurer of Kenilworth Steel Co.

Karl E. Heller was made sales manager, **Helipot Div.,** Beckman Instruments Inc., Newport Beach, Calif.

Lester B. Knight & Associates Inc., Chicago, appointed **J. H. Bertrand** vice president-plant engineering, Chicago; **J. M. Planten,** vice president-plant engineering, New York.

O. W. McMullan was appointed director of research and development, **Bower Roller Bearing Div.,** Federal-Mogul-Bower Bearings Inc., Detroit. He is assisted by **William F. Eaton,** who was promoted from assistant chief engineer to associate director of research and development.

Ernest E. Brayshaw was appointed division superintendent in charge of all rolling mill operations of steelmaking facilities at **Keystone Steel & Wire Co.,** Peoria, Ill. He was project engineer, Blaw-Knox Co.

Hamilton Mfg. Corp., Columbus, Ind., appointed **Thomas R. Henderson** general sales manager. Former director of sales, he is succeeded by **Arthur F. Kimberley,** former eastern sales manager.

John A. Tapparo was made plant manager, **Orr & Sembower Inc.,** Reading, Pa. He was general superintendent.

Norman Schuette was elected executive vice president, **Milwaukee Crane,** Cudahy, Wis., a division of Industrial Enterprises Inc. He was vice president - assistant general manager.

Cooper-Bessemer Corp. named **Roy W. P. Johnson** assistant New York district manager; **Curt J. Havekotte,** New York branch manager.

J. Bishop & Co. Platinum Works, Malvern, Pa., appointed **Ralph J. Reiman** director of industrial relations for all divisions of the company.

R. William Rapp was appointed manager of sales and engineering, **Buford Tool Co.,** Hazel Park, Mich. He was chief engineer of Parmco Engineering Co.

Herbert M. Drissen was made vice president, **Rickert Industrial Supply Co.,** Milwaukee. Formerly sales manager, he is succeeded by **Ralph W. Lund.**

Herman B. Block was elected an executive vice president, **Merritt-Chapman & Scott Corp.,** New York. He is succeeded by **Louis Goldberg** as vice president for procurement. Mr. Block succeeds **Rolland O. Baum,** recently advanced to the new post of executive vice president and general manager of the subsidiary, Tennessee Products & Chemical Corp.

Samuel K. Lackoff was appointed president of **Van Norman Industries Inc.'s** newly formed electronics division, Manchester, N. H., which replaces Transitron Inc. and Insuline Corp. of America, and brings under one management operations previously conducted separately.

Hugo G. Becker Jr. was appointed southern regional manager for **Latrobe Steel Co.** He is at Tampa, Fla.

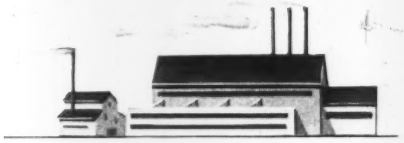
Jack D. Cavan was appointed assistant general manager of sales, bolt and nut division, **Republic Steel Corp.,** Cleveland. He succeeds **R. C. Klemm,** retired. Mr. Cavan was sales manager of the division's San Francisco district. **H. D. Burdick** and **W. C. Schnackel** continue as assistant general managers of sales of the division.

Donald A. Drake was made southwestern district manager for **Tube Turns Plastics Inc.** He is at Houston.

William H. Cochrane was elected president, **Neptune Meter Co.,** New York, effective Feb. 1. He will succeed **Dante E. Broggi,** who will serve as a consultant. Mr. Cochrane is now executive vice president.

George E. Stalle was named general manager, building products division, **American Welding & Mfg. Co.,** Warren, Ohio. **Dr. I. A. Oehler,** executive vice president, has been acting general manager of the division since June. Mr. Stalle was vice president of operations and general manager of the Perfit Products Div., Spickelmier Industries.

William F. Courter was named assistant manager-distribution, **Aluminum Co. of America,** Pittsburgh. He was assistant product manager



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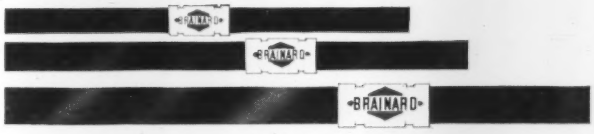

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WARREN OHIO

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EDWARD E. MUELLER
heads Whirl-Air-Flow

LAWRENCE ALLISON
joins Cyril Bath

L. E. TOWNSEND
heads Armco's Piqua plant

ALFRED C. WENZEL
Republic Flow production mgr.

for castings at the Vernon, Calif., works.

Whirl-Air-Flow Corp. elected **Edward E. Mueller** president; **Ray G. Pence, George W. Anselman,** and **G. L. Babcock,** vice presidents. Mr. Mueller joined the firm in September. He was president of Foundry Supply Co. Whirl-Air-Flow has relocated plant and executive offices from Chicago to Minneapolis.

Lawrence Allison, former head of the manufacturing methods group of Chance Vought Aircraft Corp., joined **Cyril Bath Co.,** Solon, Ohio. He will serve as sales engineer, with responsibilities in all phases of company operations.

W. B. Wight was appointed manager of the new materiel department, ElectroData Div., **Burroughs Corp.,** Pasadena, Calif. The department encompasses both purchasing and manufacturing control functions involved in production of ElectroData's electronic computing equipment.

William P. Burke resigned as vice president-general manager of Nikoh Tube Co., Chicago, to establish **W. P. Burke & Associates,** business counselors in steel, nonferrous metals, and related products.

James D. Moore, chief process engineer, was promoted to production manager, **Vitro Uranium Co.,** Salt Lake City, Utah.

A. L. Collin was appointed chief development engineer at **Kaiser Steel Corp.'s** Montebello, Calif., fabricating division plant.

L. E. Townsend, manager of **Armco Steel Corp.'s** quarries in Piqua, Ohio, assumes added responsibilities in March as manager of the Piqua tubing plant. He will succeed **William Stahly,** retiring.

Richard L. Deily was appointed sales manager for a new line of cutting machines at **American Messer Corp.,** New York. Formerly with Air Reduction Co., he was in charge of sales engineering of oxygen uses in the steel industry.

Allan S. Austin was elected president of **Austin Co.,** Cleveland. He continues as vice president of sales. **George A. Bryant,** former president and general manager, was elected chairman and chief executive officer. **Harold A. Anderson,** vice president-assistant general manager, becomes executive vice president and general manager. **Harold A. Hallstein,** former executive vice president, was elected vice chairman.

Virgil P. Poe was named district sales manager in charge of a newly opened Pittsburgh office of **Fairmont Aluminum Co.**

Arthur W. Kurz Jr. joined **Tann Corp.,** Congress Drives Div., Detroit, as manufacturing manager. He resigned as general manager, Advance Plating Co. Inc.

Smith & Caffrey Steel Co. Inc., Syracuse, N. Y., named **D. Ray Park** president and general manager. He succeeds **David C. Park,** who becomes chairman. **George A. Small** was elected senior vice president and treasurer. **Albert M. D. Cassel** was named a vice president and chief engineer.

Alfred C. Wenzel was named production manager of **Republic Flow Meters Co.,** subsidiary of Rockwell Mfg. Co. He is responsible for manufacturing and production control operations in Republic's two Chicago plants.

E. J. Van Valkenburgh was appointed director of **Alco Products Inc.'s** newly organized procurement and materials service division, Schenectady, N. Y. He was manager of procurement and material control for the company. Included in his new duties will be value analysis services for Alco's four product divisions.

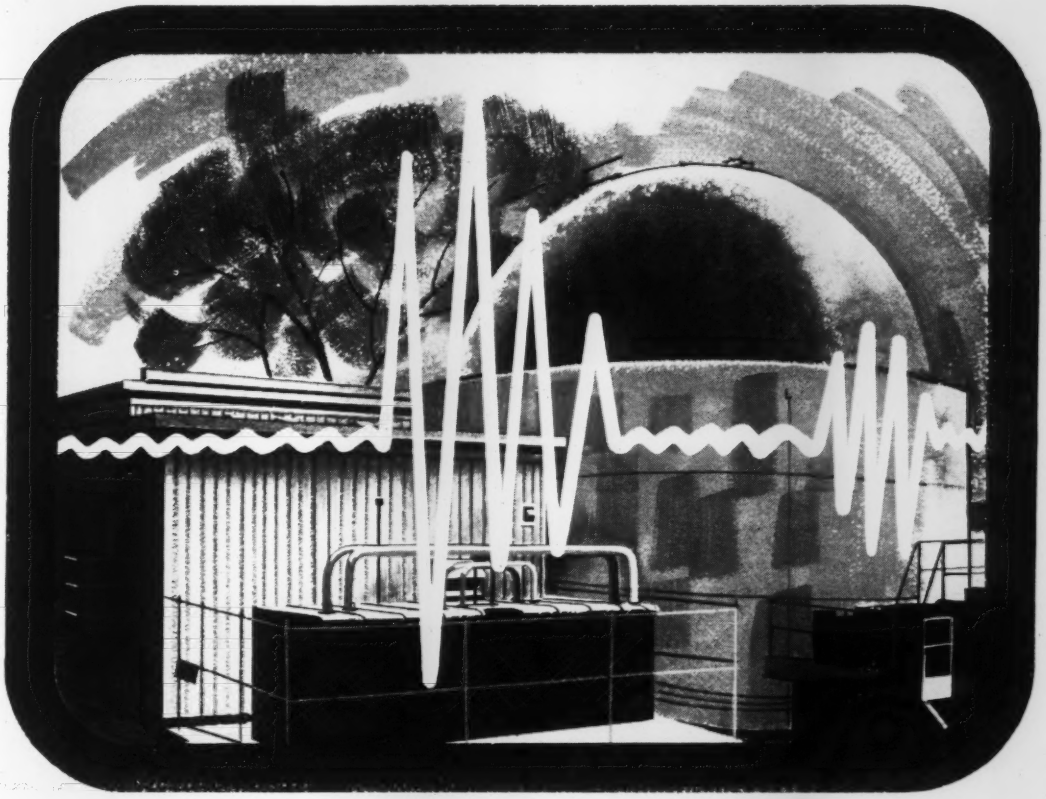
R. W. Holman fills the new post of division chief engineer, **Tennessee Coal & Iron Div.,** U. S. Steel Corp., at Birmingham, effective Feb. 1. He is presently assistant vice president-research and technology for the corporation at Pittsburgh.

J. M. Gerber was made western regional sales manager, wire and cable division, **Electric Auto-Lite Co.,** Toledo, Ohio. He continues headquarters at Los Angeles, where he served the division as California district sales manager.

James A. Summer was appointed manager of export sales for **Lycoming Div.,** Avco Mfg. Corp., at Stratford, Conn.

Joseph S. Doczy was made sales manager, Pittsburgh district, coal chemical sales division, **United States Steel Corp.**

Robert A. Chorpenning succeeds **Floyd E. Alexander,** retired, as superintendent, Marine Ways, Flor-



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Equally efficient in contact or immersion use, the Sperry Ultrasonic Reflectoscope provides a simple, nondestructive *and economical* way to locate internal defects in materials. Its versatility, indicated by the two examples of tubing inspection, has been proved in thousands of other applications ranging through quality control, periodic maintenance, laboratory investigations, etc.

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COMPANY_____

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CITY_____ ZONE_____ STATE_____

PHILIP HAWKINS
Texas Steel president

HOWARD HIGHTOWER
Hurst sales v. p.

RAYMOND J. WILCOX
Motor Wheel exec. v. p.

effe, Pa., **Jones & Laughlin Steel Corp.**

Philip Hawkins, secretary-treasurer, **Texas Steel Co.,** Ft. Worth, Tex., was named president to succeed **W. A. E. Woods,** retired. Other new officers include: **B. V. Thompson,** vice president and assistant to the president; **Thurman Killman,** vice president; **M. C. Boisselier,** vice president; **E. F. Laminack,** assistant vice president; **Charles T. Ragland,** secretary and director of purchases; **Robert E. McHam,** treasurer.

William K. Cordier was named manager of **General Electric Co.'s** diamond pilot plant operations, metallurgical products department, Detroit.

Robert M. McCafferty was appointed assistant superintendent of the continuous buttweld tube mills at **Youngstown Sheet & Tube Co.'s** Indiana Harbor Works, East Chicago, Ind.

Roy E. Johnson was appointed engineer of the eastern and New England districts for **Firth-Loach Metals Inc.,** McKeesport, Pa. He was sales engineer and general manager, Precision Tool & Die Co.

H. Perry Smith, assistant director of research, **Associated Spring Corp.,** Bristol, Conn., succeeds **Franz P. Zimmerli,** retired, as director of research.

George H. Midgley, former general and eastern division sales manager, **Dominion Bridge Co., Ltd.,** Montreal, Que., is now in charge of the development of general sales policies.

Howard Hightower was appointed vice president-sales, **Hurst Tool & Mfg. Co.,** Princeton, Ind. He recently resigned as comptroller and secretary-treasurer of Potter & Brumfield Inc. Mr. Hightower has been with Hurst for five years, and has been its secretary-treasurer for the last three.

L. W. Randt was made director of program planning for **Oliver Corp.,** Chicago. He was chief engineer of its tractor plant in South Bend, Ind.

A. F. Pickard was made director of technical development, **Diamond Drilling Div.,** Wheel Trueing Tool Co., Detroit.

Otmar E. Teichmann was appointed associate director for engineering at **Borg-Warner Corp.'s** center in Des Plaines, Ill. **Charles S. Wiggins** was made manager of the company's Washington office.

Clayton H. VanderMeer was appointed special assistant to the manager of sales engineering in charge of the controls group at **Rapids-Standard Co. Inc.,** Grand Rapids, Mich.

T. E. Ward retired as president and general manager of **Badger Malleable & Mfg. Co.,** South Milwaukee, Wis., which last year became a part of Mueller Industries Inc. His son, **James E. Ward,** was named executive vice president to head the company.

James E. McNeight was appointed purchasing agent of **Ford Motor Co.'s** Buffalo assembly plant. He succeeds the late **William E. Baer.**

Raymond J. Wilcox was elected executive vice president, **Motor Wheel Corp.,** Lansing, Mich. He was manager of the automotive plant in Newark, Del. **Stanley N. Johnson** was elected vice president-manufacturing. **R. A. Cole,** an executive vice president, retires Mar. 1.

Thomas M. Galbreath was named eastern manager of sales, **Sharon Steel Corp.,** following consolidation of New York and Philadelphia sales offices into one eastern regional sales office in New York. **Edwin A. Wylde** becomes Philadelphia sales representative; **Edward G. Davis,** Chicago district sales representative. **George L. McCaffrey** transfers to the Sharon district sales office as a sales representative. He served in that capacity for Sharonsteel Products Div., Farrell, Pa.

Minnesota Rubber Co., Minneapolis, elected **Robert R. Johnson** vice president-engineering; **E. Burke Neff,** vice president-quality and cost control; **Loren J. Sewall,** vice president-manufacturing; **Richard G. Wells,** vice president-director of sales.

E. V. Collins was appointed plant engineer, **U. S. Metal Coatings Co. Inc.,** Middlesex, N. J. He was with Chromium Corp. of America.

OBITUARIES...

James B. Hutchinson, 47, vice president, **Leach Steel Corp.,** Rochester, N. Y., died Jan. 10.

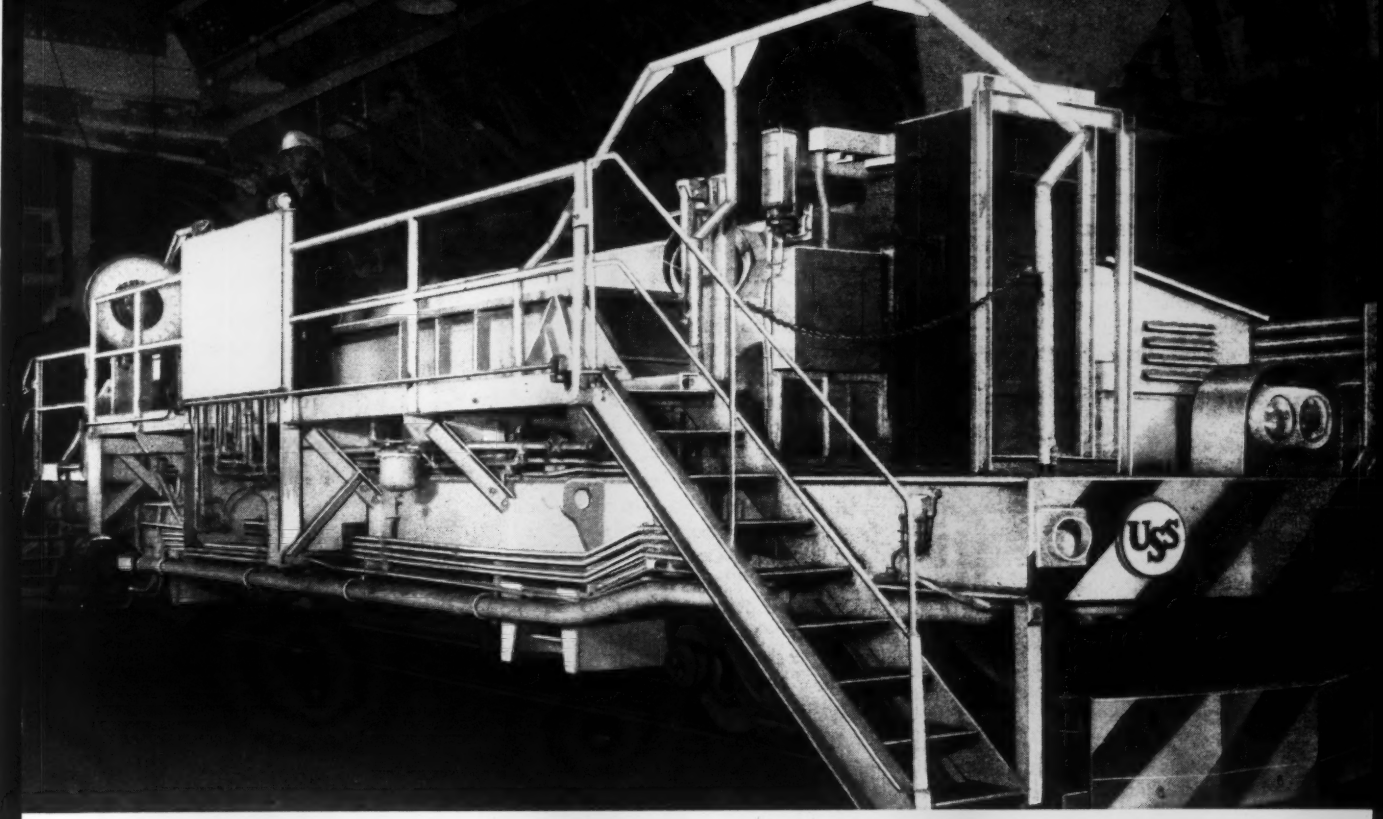
Edward P. Butler, director of standards, **Carrier Corp.,** Syracuse, N. Y., died Jan. 9.

W. E. Buck, retired chief metallurgist, sheet division, **Continental Steel Corp.,** Kokomo, Ind., died Jan. 10.

Harry Young, 53, purchasing agent, **Iroquois Steel & Iron Co.,** Chicago, died Jan. 13.

Robert Gieringer Sr., 74, a founder and vice president, **Milwaukee Machine Products Co.,** Milwaukee, died Jan. 11.

Ralph J. Cantlebury, 63, vice president, **Royal Engineering Co.,** Los Angeles, died Jan. 6.



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HERE is one of the most modern USS*-designed industrial cars in use. It is a self-propelled, automatic, weight-recording car for carrying up to 40 tons of ore and other materials from storage bins to the blast furnace.

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The car's most unique feature is its weighing apparatus. The hopper is on hydraulic load-cells which actuate an electronic mechanism as the car is filled. The mechanism operates a scale on which the weight can be read by the operator. The weight is also recorded on two tapes—one for ready reference, and one which is rolled into a locked box to serve as a permanent record of the materials charged into the blast furnace.

The manufacture of industrial cars of all types and sizes is a USS specialty, produced at our Johnstown Works. Our engineers can provide complete designs, if you wish. Our 32-page illustrated booklet, "USS Custom Designed Cars," contains more detailed information. We will gladly send you a free copy. Write today.

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Missilework Soars

Industry mobilizes resources to carry out government's accelerated defense program

PRIVATE INDUSTRY is marshalling its resources to carry out the government's accelerated missile program. Contracts placed recently included one in an Air Force project for $19,278,275 awarded to Hughes Aircraft Co., Culver City, Calif., for advanced versions of the Falcon air-to-air guided missile. Work will be done at Tucson, Ariz.

Another Air Force contract was placed with Boeing Airplane Co., Seattle, for production of some 100 Bomarc missiles and ground support equipment.

Designers for Industry, Cleveland, has been awarded a $370,000 contract to build Redstone missile check-out equipment in a crash program for the Army Ordnance Ballistic Missile Agency, Redstone Arsenal, Huntsville, Ala. That firm recently completed a $1,513,000 contract for a guidance system check-out program for the Redstone under subcontract with Chrysler Corp., Detroit.

AMF Program — Many metalworking companies are revising their operating schedules to meet defense needs. Some are undertaking missile projects in conjunction with other firms to take advantage of combined resources. American Machine & Foundry Co., New York, is closing its Boston electronics plant and reassigning the plant's work to facilities in Greenwich, Conn., and Pomona, Calif.

The new arrangement is designed "to strengthen our capabilities in the guided missile and defense electronics field," says Morehead Patterson, AMF board chairman and president. Dr. W. B. Sell has been made a divisional vice president with headquarters in Pomona.

An AMF subsidiary, Associated Missile Products Corp., Pomona, now becomes a unit of AMF's electronic operations with its capabilities in the field of electronics augmented by work and key personnel from the Boston plant. This firm is experienced in engineering and production of guided missile support equipment. Among the projects AMF will shift to Pomona are manufacture of the digitron and its data processing and handling equipment, and a radar beacon, all used in the guided missile program.

AMF's laboratories in Greenwich, where such missile development work as the Talos handling and launching system was accomplished, will absorb Boston's contracts on precision instrument mounts and tracking instrument mounts for guided missiles.

Stauffer-Aerojet — Aerojet-General Corp., Azusa, Calif., and Stauffer Chemical Co., New York, have formed a jointly owned firm, Stauffer-Aerojet Co. This company will develop and produce boron compounds, expected to be used widely as fuels for rocket, missile, and airplane propulsion.

Metal Treater To Build

Metallurgical Inc., Minneapolis, plans to build a $4-million plant in the Buffalo area. The firm will install a large drop bottom metal treating furnace and will have a metallurgical laboratory in the 50,000 sq ft plant.

Buys Weaving Equipment

Dodge Wire Corp., Atlanta, has purchased 41 high-speed weaving machines for the production of aluminum insect screening. They will be installed in its Covington, Ky., plant. The machines were designed by Warner & Swasey Co., Cleveland (see STEEL, Dec. 16, 1957, p. 124).

New Firm Makes Burners

Industrial Combustion Inc., a new company in the commercial-industrial oil and gas burner industry, acquired facilities of the Burner Div. of Cleaver-Brooks Co., Milwaukee. The firm is constructing a plant and engineering laboratories in Monroe, Wis., which will be ready for occupancy in March. Executive offices will be at 4507 N. Oakland Ave., Milwaukee, Wis. Officers are: President, J. V. Resek; vice president-engineering, Howard McCoy; and secretary, Robert Harland. Sales manager is W. J. DeMuth; purchasing agent, Clarence Gruber.

Apex Enters New Field

Apex Smelting Co., Chicago, producer of aluminum, magnesium, and zinc alloys, is now a supplier of aluminum billets for extruders. The billets are produced with direct-chill casting equipment.

Gets Floor Plate Rights

Wheeling Steel Corp., Wheeling, W. Va., has obtained exclusive manufacturing rights for the production of Ancor floor plates. They are being made at its Ackerman factory from die-punched rolled steel and are being marketed by Ackerman Mfg. Co., a sales subsidiary.

Two Firms Change Names

F. E. Anderson Oil Co. Inc., Portland, Conn., changed its name to Anderson Oil & Chemical Co. Inc.

Neenah Brass Works, Neenah, Wis., changed its name to Neenah Brass & Aluminum Foundry Inc.

Plans Welding Research

International Nickel Co., New York, has contracted with Rensselaer Polytechnic Institute, Troy, N. Y., for a new program of research in the welding of ductile iron.

Opens Indianapolis Plant

H. & B. American Machine Co. Inc., Chicago, moved its Midwest Div. to a new 110,000 sq ft plant in Indianapolis. The firm produces structural parts and components for aircraft. The parts are forged in such materials as high-strength alloy steel, aluminum, and titanium. On Jan. 2, H. & B. acquired the assets of Liberty Aircraft Products Corp., Farmingdale, N. Y., another leading subcontractor for aircraft and missile parts.

Offers Fabrication Service

Griscom-Russell Co., Massillon, Ohio, manufacturer of heat transfer units, is operating a special service facility at its plant. It

Scrivener's Parking Building, Baltimore. Aluminum paneling is treated with beautiful Bonderite Architectural Green.

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You'll see many more buildings, like this attractive structure in Baltimore, using aluminum finished with Bonderite Architectural Green. There are so many things to recommend this beautiful, durable Bonderite coating!

Treatment with Bonderite Architectural Green protects aluminum from corrosion. The same protective treatment chemically produces a soft, lasting green color which is a part of the integral coating of the metal surface. Color is sun-and-weather-fast.

Bonderite Architectural Green costs far less than electrolytically produced color coatings for aluminum. It is simple to use, and the color uniformity is a sure visual check on the uniform quality of the coating, maintained in volume production day in and day out.

Bonderite Architectural Green may be applied by spray or immersion, and by continuous strip treatment.

Metal treated in this manner can be used not only in construction panels, but also for siding, awnings, venetian blinds and many items on which the excellent color and durability contribute to a better, more salable product.

Write for descriptive illustrated booklet "Bonderite 700 Series". Details on Bonderite Architectural Green, uses, advantages, characteristics.

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will service companies requiring a combination of special equipment and welding, brazing, assembling, and quality control techniques for the fabrication of precision products. The firm's equipment can make products that weigh only a few ounces to 60 tons.

Forms Rio Tinto-Dow Ltd.

Rio Tinto Mining Co. of Canada Ltd., Toronto, Ont., and Dow Chemical of Canada Ltd., Sarnia, Ont., formed a new company, Rio Tinto-Dow Ltd. The organization will concentrate on the production of thorium and rare earths. (They'll be made from byproducts of uranium mining operations in the Blind River area of Ontario.) Officers include Robert Winters, president, and Dr. J. D. Head, general manager.

Offers Aluminum Pellets

Hummel Chemical Co., New York, is offering aluminum pellets or shot for the manufacture of aluminum killed steel. The pellets are packed in steel containers which can be added to the heat.

Organizes Wrecking Firm

Arnold-Roblin-Luntz Corp. has been organized to do heavy industrial wrecking and dismantling. Headquarters are at E. 68th Street and Berdelle Avenue, Cleveland 4, Ohio. Officers are: President, I. L. Arnold; vice president, Stanton Luntz; and treasurer, T. M. Luntz. Dan Roblin, president of Roblin Inc., Buffalo, will also be associated with the firm.

Bliss & Laughlin Buys Land

Bliss & Laughlin Inc. purchased 27 acres at South Holland, Ill., less than a mile from its Harvey, Ill., plant.

Arthur Lear, president, makes this observation: "Because we have exhausted our available floor space at the Harvey plant, we took steps to protect ourselves for expansion. This location will be at the 'back door' of the Calumet port of the St. Lawrence Seaway. We have been using the inland waterways to transport our steel, particularly to the Southwest, and we feel that the use of this method of transportation will continue to grow."

SPS Expands Division

Standard Pressed Steel Co., Jenkintown, Pa., formed an Aircraft & Missiles Div., an extension of what was its Aircraft Products Div. The step was taken because of increasing business in high strength, high temperature fasteners and related hardware for missile airframe, rocket engine, and guidance system applications.

Broadens Rolling Service

American Silver Co., Flushing, N. Y., formed a division devoted exclusively to the toll rolling of unusual metals and alloys, such as zirconium, columbium, and tantalum. Thicknesses can be as low as 0.0005 in., tolerances as close as plus or minus 0.0001 in.

Steps Up Nuclear Activity

Nuclear Products Div. of Metals & Controls Corp., Attleboro, Mass., has been organized as a wholly owned subsidiary under the name of M&C Nuclear Inc. The firm's nuclear work involves the fabrication of fuel elements, components, and cores. Jerome Ottmar is president of the subsidiary; G. L. Williams, treasurer and clerk.

Rounds Out Foundry Line

C. & S. Products Co. Inc., Detroit, has affiliated with Barber-Greene Co., Aurora, Ill. C. & S. Products makes foundry shell core and shell mold blowers. Barber-Greene makes belt conveyors, railroad car unloaders, bucket loaders, ditching equipment, and other construction and material handling machinery.

Oakite Expands Service

Oakite Products Inc., New York, established two new divisions: Upper New York State Div., 315 Alexander St., Rochester 4, N. Y.; and Mid-South Div., Fourth and Broadway, Louisville 2, Ky. W. G. Sittmann is head of the New York division; V. L. Baltzell, Mid-South Div.

Reynolds Buys Hot Mill

Reynolds Metals Co., Louisville, awarded a contract to United Engineering & Foundry Co., Pittsburgh, for a hot strip mill to produce aluminum plates and strip at its Sheffield, Ala., mill. It will have a continuous finishing train with roll bodies 120 in. long. Delivery will be made during 1959.

NEW PLANTS

General Chemical Div. of Allied Chemical & Dye Corp., New York, has placed in operation its sulfuric acid plant at Elizabeth, N. J. It is equipped for decomposition and regeneration of byproduct spent acids which will help solve disposal problems of many industries. The division has discontinued operations at its Hudson River Works in Edgewater, N. J., which has been taken over by Allied's Barrett Div.

Jarvis Corp., Middletown, Conn., opened two plants: One at Portland, Conn., to handle specialized machining for the aircraft industry, another at Guilford, Conn., to produce food processing equipment for the meat industry.

Rich Steel Co. opened a warehouse at 5930 Bandini Blvd., Los Angeles. More than $100,000 in equipment has been installed, including edging machines, a Bucciconi roller leveler, and shearing equipment. The firm's pickling facilities will remain at the former address, 8019 Beach St., that city.

More than 75 tons of liquid oxygen, nitrogen, and argon will be produced daily at **Air Reduction Pacific Co.'s** new air liquefaction plant in Los Angeles. A fifth air separation and liquefaction plant is being constructed at Acton, Mass., with completion scheduled for summer, 1958.

Micronics Div., Elgin National Watch Co., will occupy under lease a new 60,000 sq ft headquarters and development-production plant on Route 53 on the outskirts of Palatine, Ill. The division specializes in the development and cus-

tom production of high precision components, chiefly involving guided missiles, automatic aircraft control systems, and timing instruments. George W. Fraker is general manager of the division. He will establish headquarters in the new plant.

The **George L. Ennen Co.** has begun production in its new plant at Pioneer, Ohio. The firm has contracts for parts with major segments of the automotive industry.

Grant Pulley & Hardware Corp. dedicated its plant on High Street, West Nyack, N. Y.

Consolidated Controls Corp., a subsidiary of Consolidated Diesel Electric Corp., Danbury, Conn., leased office and plant facilities at Bethel, Conn. Full scale operations are scheduled for mid-February. The firm will acquire the business and certain assets of Manning, Maxwell & Moore Inc.'s Aircraft Products Div. in Danbury, manufacturer of control systems for missiles, aircraft, and nuclear power plants.

Paranite Wire & Cable Div. of Essex Wire Corp., Ft. Wayne, Ind., is erecting a warehouse adjacent to its Marion, Ind., manufacturing plant. The 100,000 sq ft facility part of a $1-million Paranite expansion program.

Acoustica Associates Inc., Mineola, N. Y., opened a new plant at 11601 W. Jefferson Blvd., Culver City, Calif. It will produce ultrasonic instruments.

Stauffer Chemical Co., New York, will construct a large hydrofluoric acid plant next to its petrochemical plant at Louisville.

Trion (Canada) Ltd., a subsidiary of Trion Inc., McKees Rocks, Pa., is operating its new factory in Toronto, Ont. It produces electronic air cleaning units.

Rockwell Mfg. Co. of Canada Ltd. purchased a 50,000 sq ft plant at Guelph, Ont., recently vacated by Hammond Mfg. Co. The Canadian subsidiary of Rockwell Mfg. Co., Pittsburgh, makes power tools, industrial liquid meters, gas meters and regulators, parking meters, and a line of electrical conduit fittings.

Maurey Mfg. Corp., Chicago, established a warehouse at 3200 Lakeside Ave., Cleveland, Ohio. It will stock V-drive equipment.

Eutectic Welding Alloys Co., Pacific Div. Inc., opened its new warehouse service center at 5348 Jillson St., Los Angeles, Calif. The parent company is Eutectic Welding Alloys Corp., Flushing, N. Y.

NEW OFFICES

Sharon Steel Corp., Sharon, Pa., formed an eastern regional sales office in New York, responsible for east coast sales. Thomas M. Galbreath was named eastern manager of sales.

Reading Tube Corp., New York, opened a sales office and a 12,000 sq ft distribution depot in leased quarters at 921 Penn St., Philadelphia, Pa. The firm's manufacturing plant is in Reading, Pa.

American Air Filter Co. Inc., Louisville, established a central regional sales office in the Michigan Bldg., Detroit. It's under the supervision of Frank K. Platt. The company makes air filtration, dust control, heating, and ventilating equipment.

NEW ADDRESSES

Inland Steel Co. moved its headquarters to 30 W. Monroe St., Chicago 3, Ill.

F. C. Russell Co. moved its main office to Leetonia Road, State Route 344, Columbiana, Ohio. The company makes combination screens and storm sash.

Temco Aircraft Corp. moved its headquarters to Garland, Tex., a suburb of Dallas. The 100,000 sq ft corporate headquarters are joined to the recently completed 100,000 sq ft engineering center through a central lobby. The company maintains its Dallas mailing address (P. O. Box 6191).

CONSOLIDATIONS

Miehle-Goss-Dexter Inc., Chicago, acquired **Mercury Engineering Corp.,** Milwaukee. Miehle-Goss-Dexter makes graphic arts machinery and equipment; Mercury produces machinery for packaging purposes, printing press units, and auxiliary equipment.

National Malleable & Steel Castings Co., Cleveland, is acquiring the **Grand Rapids Plating Co.** and its subsidiary, **Grand Rapids Die Casting Co.,** Grand Rapids, Mich. About 75,000 sq ft of plant space and slightly over 14 acres of land are included in the properties.

Double A Products Co., Manchester, Mich., has joined forces with **Brown & Sharpe Mfg. Co.,** Providence, R. I., as a wholly owned subsidiary. Double A makes hydraulic control valves used in construction of automated machine tools and heavy capital equipment. Brown & Sharpe, a machine tool builder, also makes gear, centrifugal, and vane pumps through its Hydraulic Products Div.

Controls Co. of America, Schiller Park, Ill., acquired **Hetherington Inc.,** Folcroft, Pa., manufacturer of precision electrical switches. The property will be operated as a wholly owned subsidiary.

American Pulley Co., Philadelphia, acquired the business and assets (excepting real estate) of **Hubbard Spool Co.,** Garrett, Ind. E. J. Hubbard heads the new division. American Pulley makes products for mechanical power-transmission, material handling equipment, and pressed steel reels.

Federal Pacific Electric Co., Newark, N. J., established district headquarters at 354 Congress St., Boston, Mass. The company makes more than 1500 electrical products. John W. Muse is district sales manager.

Van Norman Industries Inc., New York, acquired the business of Digit-Ometer Co., Denver, developer of an electromechanical accounting machine.

There's no substitute for the FORGED crankshaft

Crankshaft forgings illustrated, left to right, for V-8 passenger car, diesel truck and heavy tractor engines

Crankshafts have been made successfully by other methods of fabrication and have proven to be *good enough* for certain non-critical applications — but for maximum dependability of the modern, compact, high compression, high torque engine a forged crankshaft is essential.

The forging process assures, to the greatest degree possible, uniformity and predictability of physical properties with a minimum variance from piece to piece or from one location to another in the same piece.

Wyman-Gordon has been forging crankshafts since the beginning of the internal combustion engine era and today produces more crankshafts for a greater variety of applications than any other company in the world. In a crankshaft there is no substitute for a forging, and in a forging there is no substitute for Wyman-Gordon quality and experience.

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Technical Outlook

BLAST FURNACE TUYERES—A new design that has reduced tuyere cost 77 per cent per ton of iron for Bethlehem Steel Corp. is now available to other users. The tuyere features a high (98 per cent) conductivity copper nose and a 90 per cent conductivity body. The nose, which burns out sooner, is replaceable without scrapping the body. Cooling water is directed first to the nose where heat exposure is greatest. The "Eberhardt" tuyere is supplied by Philadelphia Bronze & Brass Corp., Philadelphia.

OXYGEN SPECIFIED—Titanium Metals Corp. of America, New York, announces that it will certify the oxygen content of all titanium alloys it produces. The company says this will help users establish reproducible mechanical properties and fabrication characteristics.

DIE BLOCK COSTS CUT—Congress Die Casting Div. of Tann Corp., Detroit, saved over $1200 by using a cast-to-shape retainer in place of a forged die block to hold automobile horn dies. A big part of the saving came in machining: 150 hours of machine time were eliminated. The Forging & Casting Div. of Allegheny Ludlum Steel Corp., supplied the steel.

MISSILE LUBRICANT—A new silicone base, extreme temperature grease has an operating range of minus 45 to plus 600° F at 30,000 rpm. Shell Oil Co., New York, which developed the lubricant, reports that vat dyes proved the most stable thickener for high temperature operation.

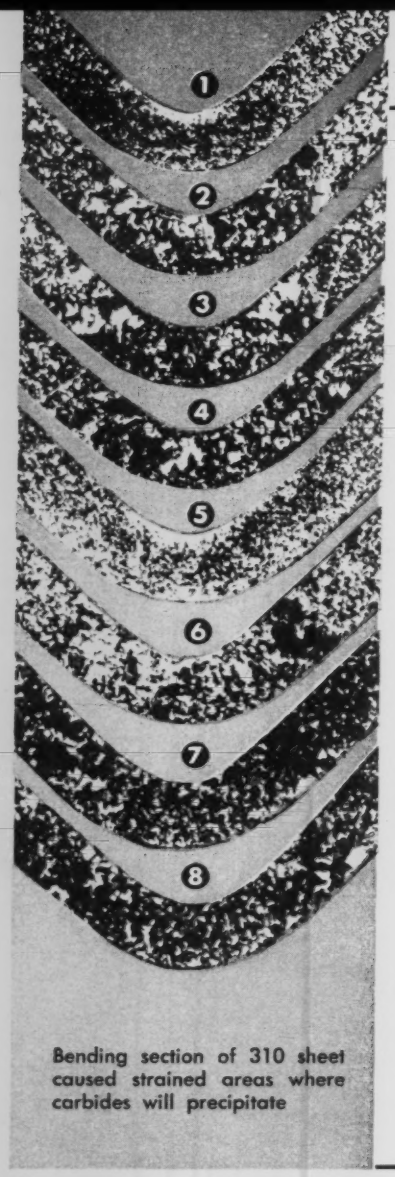
TOUGHER MISSILE WELDS—Battelle Memorial Institute, Columbus, Ohio, developed filler wires for SAE 4130, 4140, and 4340 steel which deposit metal with a tensile strength of 200,000 psi when it is heat treated. Battelle's work overcame these difficulties in missile and aircraft welds: Porosity, cracking, and inadequate toughness, strength, and response to heat treatment. The best processes, it reports, are inert gas, tungsten arc and inert gas, consumable arc. Researchers got best results with filler wire with a composition like that of the base metal. Some dissimilar wire compositions produced satisfactory welds.

METAL POWDER FASTENERS—Brass screw nuts compacted from metal powders are superior to nuts punched from sheet stock or machined from bar stock, says Midwest Sintered Products Corp., Chicago. They can be made with any degree of sharp detail; there are no scrap losses; and they have tensile strengths of 30,000 to 35,000 psi. Metal powder fasteners can be made in a variety of materials (including the hard-to-work ones like tungsten carbide); and special properties can be designed into them (lubricating and electrical properties, for example).

NUCLEAR NEWS—Westinghouse Electric Corp. has come up with two developments for nuclear reactors: A control rod material and a liquid metal pump. The control rod material, an alloy of cadmium, indium, and silver, will be considerably cheaper than hafnium, says the company. The pump is designed to circulate liquid metal through the hermetically sealed systems of certain types of nuclear powerplants.

SOUND WELDS—A defense contractor plans to weld aluminum, stainless, copper, and beryllium ultrasonically. Gulton Industries Inc., Metuchen, N. J., last week completed the equipment for the job. Features: Eight heads powered by a 4000-watt generator; capacity of 0.080 in. of metal at 50 ipm; automatic operation—the worker presses a button; the machine does the rest.

ALUMINUM BEAUTY TREATMENT—To preserve the appearance of the aluminum on the exterior of its new plant, American Sterilizer Co., Erie, Pa., coated it with a clear butyrate lacquer. It's the first large-scale test for the protective coating system, says Eastman Chemical Products Inc., Kingsport, Tenn., which developed the butyrate. It's said to withstand sunlight, fumes, and weathering without yellowing.



Bending section of 310 sheet caused strained areas where carbides will precipitate

TABLE 1—Effect of Heat Treatment on 310 Stainless

Test Sample	Low Temperature Stress Relief*	Anneal†	Carbide Network Rating
1	None	None	2,3
2	None	1980° F	1
3	None	1980° F (2 cycles)	4,5
4	None	1980° F (3 cycles)	3,5
5	1000° F	None	2
6	1000° F	1980° F	1
7	1000° F	1980° F (2 cycles)	1
8	1000° F	1980° F (3 cycles)	1
9	None	2050° F	3
10	None	2050° F (2 cycles)	1
11	None	2050° F (3 cycles)	1
12	1000° F	2050° F	1
13	1000° F	2050° F (2 cycles)	1
14	1000° F	2050° F (3 cycles)	1
15	1200° F	None	5
16	1400° F	None	6
17	1200° F	1980° F	1
18	1200° F	1980° F (2 cycles)	1
19	1200° F	1980° F (3 cycles)	1
20	1200° F	2050° F	1
21	1200° F	2050° F (2 cycles)	1
22	1200° F	2050° F (3 cycles)	1
23	1400° F	1980° F	1
24	1400° F	1980° F (2 cycles)	1
25	1400° F	1980° F (3 cycles)	1
26	1400° F	2050° F	1
27	1400° F	2050° F (2 cycles)	1
28	1400° F	2050° F (3 cycles)	1

*Temperatures were held for 2 hours, followed by air cooling.
†Temperatures were held for ½ hour, followed by water quenching.

Processing 310 Minimizes Carbides

EXCELLENT performance of 310 stainless at high temperatures is marred by its tendency to form continuous carbide networks if it is improperly handled.

Some mills are getting results by upgrading the quenching techniques they use after solution heat treatment. But the search for an even more practical solution was spurred when several mills added boron and rare earths to improve the rolling characteristics.

Mill processing benefited, but the original problem was compounded:

By HIRAM BROWN
Technical Adviser to Plant Manager,
Solar Aircraft Co.
Des Moines, Iowa

1. A fine but continuous grain boundary network occurred.

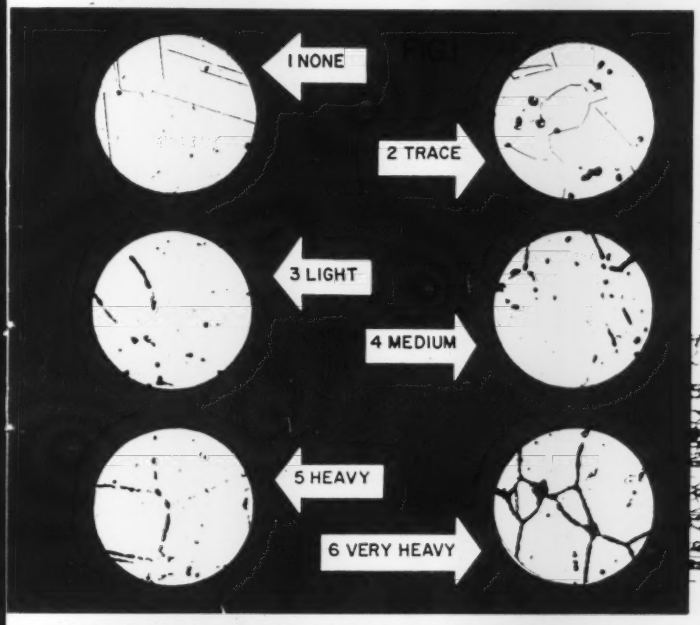
2. High solution heat treatment temperatures were required to dissolve the network. Grains formed exceeded limits on purchase orders.

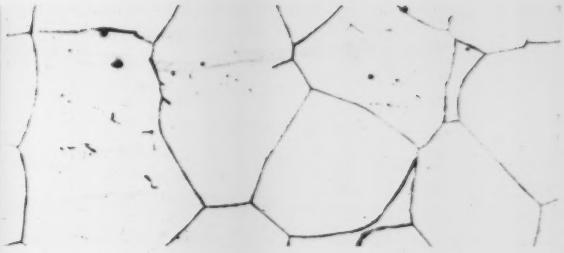
Idea—We reasoned that if the carbides could be made to precipitate within the grains rather than at the boundaries, several advantages would result. Two stand out:

1. The bad effects of continuous networks would be avoided.

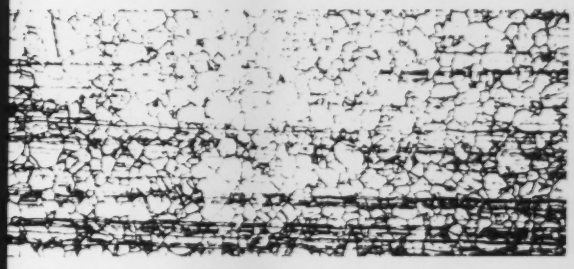
2. A temperature lower than the standard 2050° F solution heat treatment should be able to dissolve the randomly scattered carbides. (More heat is needed when the carbides must be diffused from the grain boundaries back into the grains and then dissolved.)

We did not want to add stabilizers such as titanium or columbium which give random precipitation of carbides in 321 and 347





Boron additions to 310 stainless improve rolling but cause a continuous carbide network to form. X250



Two hours at 1200° F followed by air cooling resulted in a C5 carbide rating. The structure shows scatter of carbides caused by bending and heat treatment. X50

Annealing at 1980° F plus water quenching improved carbide rating to C1. X50

TABLE 2
Analysis of AMS 5521 (T-310) Alloy
(0.063 in. sheet stock)

Element	Per Cent
Carbon	0.038
Manganese	1.68
Phosphorus	0.018
Sulfur	0.006
Chromium	24.40
Nickel	19.90
Silicon	0.67
Copper	0.15
Molybdenum	0.10

Prestraining the metal followed by stress relieving at 1000 to 1400° F before solution heat treatment precipitates carbides within the grains rather than at the grain boundaries

stainless because they could cause "dirty" steel and introduce other variables in the 310 alloy.

The Process — As a starting point, we used the principle that carbides will precipitate in strained areas. We decided to strain 310 specimens, then precipitate carbides by subjecting the specimens to a sensitizing temperature which would precipitate carbides in the strained areas within the grains. The final step was to observe the reaction of these particles to various heat treatments.

The analysis of the sheet material used is shown in Table 2. This heat was selected because it showed a tendency to form troublesome carbide networks in normal shop processing.

The Steps—Samples of the material, as received, were checked against an established set of microstructures which rate carbides from 1 (good) to 6 (bad)—see Fig. 1. The samples were then bent at right angles parallel to the long dimension in a restricted bend-type fixture. A bend factor of 1.5T was used. The bend is shown at left.

The specimens were heat treated as shown in Table 1. The 1980° F temperature used in annealing is 70° F below the normal recommended solution temperature.

Test Results — Table 1 shows that prestraining followed by 1000 to 1400° F stress relief permits easier solution of carbides by the use of normal solution temperature. Lower than normal solution temperatures can be used without any adverse effect on the carbide rating. (Some increase in carbon content may influence the results.)

One mill has run a complete heat of sheets, using the techniques discussed in this article. The material produced had a satisfactory carbide rating.

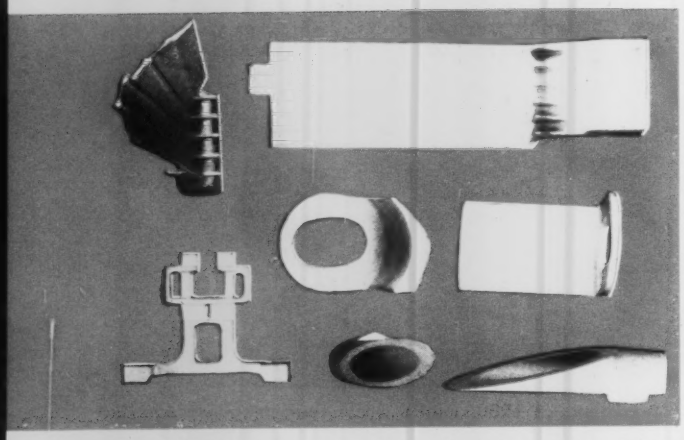
Carbon Arc Vs. Induction Melting

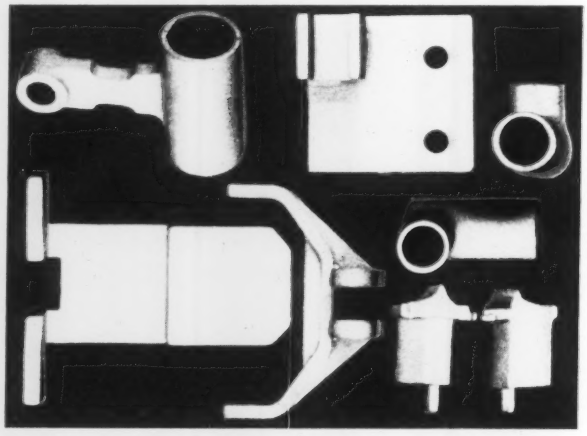
Both methods are used by investment casters. This article compares them on the basis of part design, relative cost, control or reproducibility of results, and versatility

A COMPARISON of the carbon arc and induction melting techniques is most useful when it is based on data compiled at a foundry that uses both extensively for investment casting.

The data for this comparison come from the General Electric Investment Casting Foundry, Schenectady, N. Y. It is a captive operation producing castings in limited quantities. The data were reported by L. J. DiNuzzo at the fifth annual meeting of the Investment Casting Institute at Chicago.

Melting equipment in the GE foundry includes a $3\frac{1}{2}$ and a 10 lb indirect carbon arc furnace, and a 100-kw induction melting unit with furnaces of 50, 100, and 200 lb capacities. Ladles of 60 or 100 lb capacity are used for pouring off induction melted heats.





The left photo shows examples of ideal arc pot applications. Top to bottom: Ribbed bucket airfoil (X-40 or Stellite 31), cam (410), and nozzle (Stellite 21). At bottom left is a coil support (303). The nozzle also was successfully cast using induction melting. Attempts to make the other three parts from induction heats using normal gating and heading practice resulted in many rejects due to nonfill. A combination of high pouring temperatures and excessive heading eliminated nonfill, but were impractical. The right photo shows parts that were successfully made using arc and induction melting. In most cases, the method used depended on quantities and material costs

DESIGN

With the arc furnace, pressures up to 30 psi can be applied on the melt during pour. That gives a better chance of filling out thin sectioned castings that would be possible in a gravity pour induction heat. There is nothing from a design standpoint (except alloy and weight) to prevent casting of a part on the arc pot.

Fill problems can sometimes be eliminated in induction heats by use of a vacuum pouring stand.

Weight Limitation—One of the most serious disadvantages of the arc pot is its limited capacity. Although yields are high because pouring is done under pressure, 5 or 6 lb of castings is the maximum that could be expected from a 10 lb unit. With induction melting, for all practical purposes there are no weight limits.

The arc pot also is limited as to type of alloy that can be melted. Carbon pickup is a problem in low carbon alloys. However, since it is possible to use a protective atmosphere during meltdown and pour, the arc pot gives excellent results, surfacewise, with alloys containing high titanium and aluminum.

COST

The selling price of a casting depends largely on direct labor and material costs.

A 100-kw induction unit, on a production basis, can melt about 1200 lb of metal a day. To pour a heat of investment molds, a five-man crew is used.

However, four of the men perform other assignments between pours that take about 50 per cent of their time. Effectively, there is the equivalent of three men full time on melting and pouring. This figures out to about 400 lb of castings per man per day.

One man can operate two 10-lb arc furnaces and can pour about forty 10-lb heats a day. Labor time for melting is practically the same.

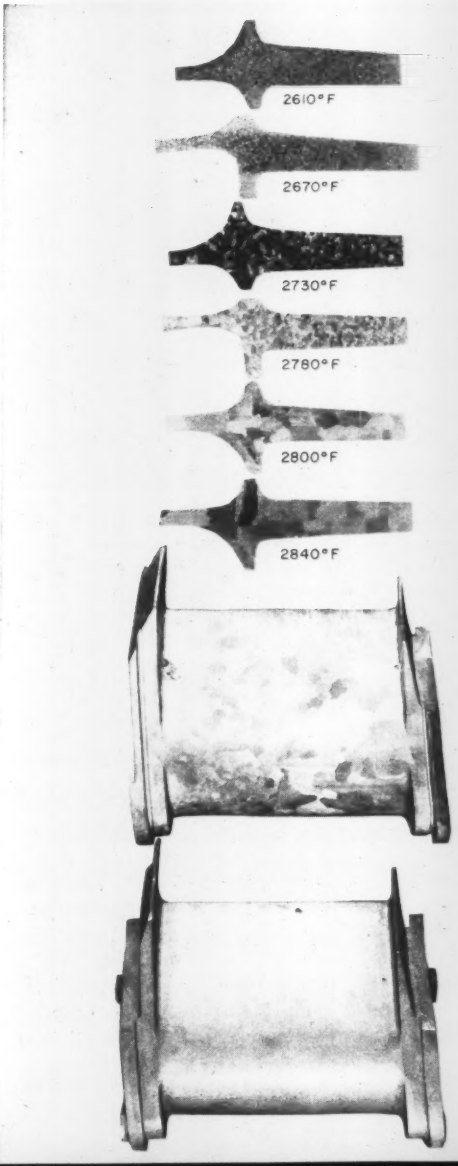
However, since induction melting has no weight restriction, fewer molds can be processed with more castings per mold. More than enough time will be saved in the precoating and investing operation to compensate for the extra setup time. Processing fewer flasks will probably save in refractory and metal.

Material Cost—A serious disadvantage of carbon arc melting costwise is that all heats are made from remelt stock. With induction melting, foundry returns can be remelted with considerable saving in material cost.

In one case, for a casting poured in Stellite 21, the arc furnace material was 15 cents, compared with 5 cents for induction melting. Selling price of the casting was 89 cents.

Installation, maintenance, and repair costs are much lower for arc furnaces than for induction units.

CONTROL



Not too long ago, the typical buyer of a high alloy investment casting was interested in an intricate shape, good surface finish, fairly close dimensions, and reasonable soundness. Most high alloy components were overdesigned with generous safety factors.

The picture has changed radically. Aircraft designers are using alloys with marginal strengths and are applying less safety factor in an effort to cut down weight and improve performance. Reliability of castings may soon be more important than cost.

Control Important—Specifications are being written covering grain size requirements as well as mechanical properties. Process control is becoming increasingly important for the investment caster.

In investment casting of stainless steel and high alloys, the melting operation is probably the most critical step in the process.

Composition, grain size, gas content, and melt history (nature of charge, superheat, order of melting, deoxidation) all have an important bearing on the properties of high alloy castings.

Composition—Since the arc furnace uses remelt stock, casting composition depends to a degree on the charge. Because of overheating tendency and poor temperature control in small heats, there will probably be a deviation in composition from melt to melt although the same master heat is used.

Where close control of composition is important, the 100 or 200 lb induction heat has a decided advantage over the 10-lb arc pot heat. Because of the heat size, an analysis for each heat can be justified

At top are sections cut from X-40 turbine buckets that were poured under conditions where pouring temperature was the major variable. Temperatures given are ladle readings just before pouring. (The melting point of X-40 is 2550° F.) The grain size obtained at 2610 and 2670° F is generally satisfactory; at 2730° F and above, the grain size is too coarse. This indicates how narrow is the range of pouring temperatures. Just below the bucket sections is a shrouded partition (X-40) showing grain size obtained on an arc pot using an optical pyrometer. The bottom photo is the same casting, using immersion thermocouple

CONTROL . . .

and, since composition in the induction heat can be closely controlled, the chemistry within the specification can be adjusted to change fluidity, mechanical properties, and structure.

Often, direct-reading spectrographs are used with induction melted, high alloy heats. The units can determine up to 19 elements in 12 minutes and allow adjustments in the melt chemistry to be made before pouring.

Grain Size—Control of grain size also is a problem in arc melting. GE has found the best way to control grain size is by control of pouring temperature (see photo on Page 75). Mold temperatures in the range of 1200 to 1800° F have practically no influence on grain size, compared with metal temperature.

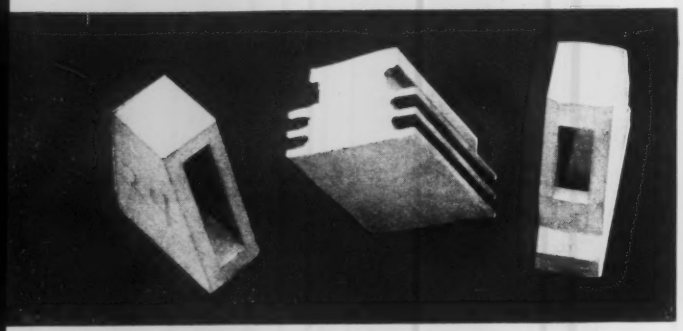
In induction melting, GE makes extensive use of immersion thermocouples to get best temperature control. With the arc furnace, the foundry must depend on optical or pyrometer readings which may be in error because of the time interval between the reading and the pour, or because of oxide or slag blankets on the melt.

Upgrades Metal—By closely controlling grain size and induction melting practice, GE was able to upgrade the properties of X-40 considerably. For induction melted heats, the reduction in area for buckets in the aged condition, tested at 1650° F and 20,000 psi, averaged 20 to 21 per cent compared with values of 8 to 9 per cent obtained using arc melting equipment and techniques.

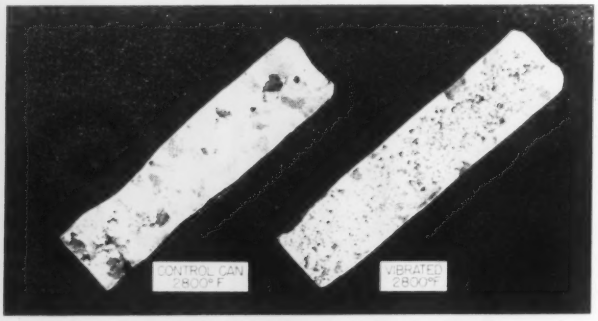
During the same program, a side investigation was conducted on the effect of gases on stress-rupture properties. Results: Oxygen tended to increase stress-rupture life with considerable loss in ductility. Nitrogen markedly improved stress-rupture life and ductility, but tended to lower 1200° F tensile strength.

Advantages in Control—The investment caster who pours 100 lb and 200 lb induction melted heats has these advantages to offer the buyer interested in high quality, high alloy castings:

1. Close chemical control. Analyses are the chemistry of the casting, not of the charge.
2. Close temperature and grain size control.
3. Close control over gas content, especially oxygen and nitrogen.
4. Control over melt history.
5. Control over deoxidation practice. Deoxidation of small carbon arc heats is difficult because the small quantities called for are almost impossible to add efficiently.



The left photo shows castings of pure nickel. The parts were required in small quantities and were run off on a 3½-lb arc furnace. The smallest induction furnace available had 50-lb capacity. The right photo shows the influence of vibration on grain size of cast 316 stainless. Vibration is one of the new casting techniques readily usable with induction melting. Few of the new techniques can be used with carbon arc melting



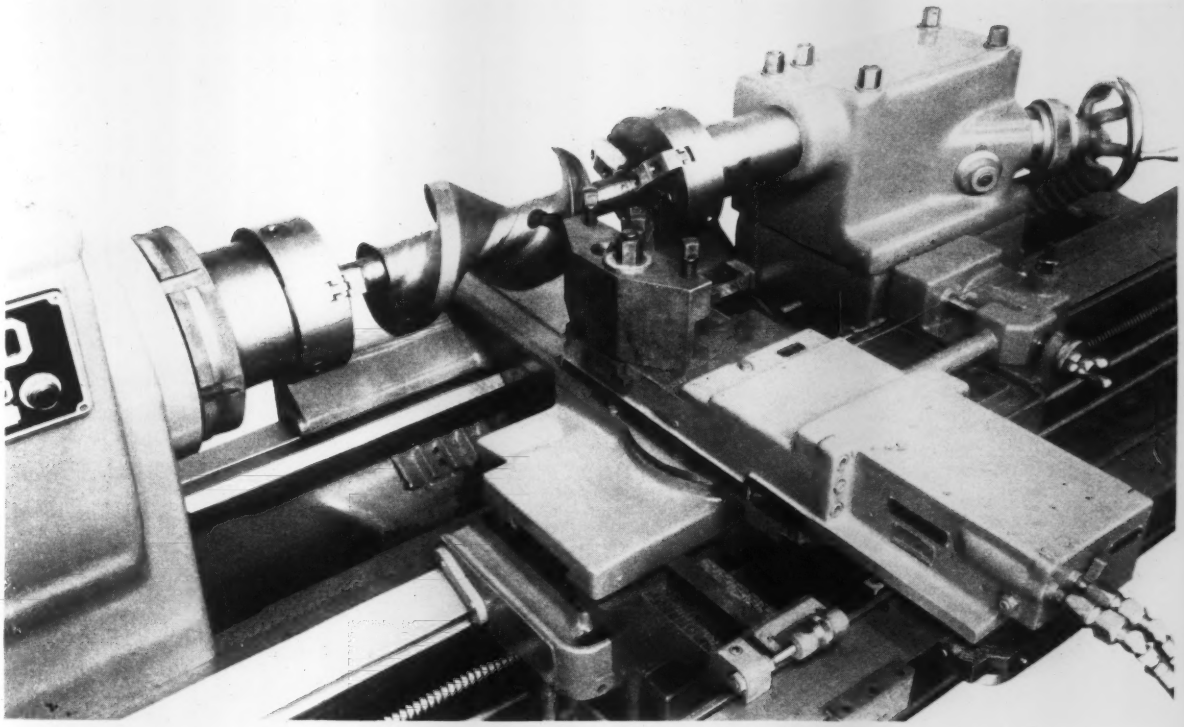
VERSATILITY

The carbon arc furnace is ideal for short run work. Since heats are small, a larger number of alloys can be poured in a day. But practical use of the arc furnace is limited to investment castings.

New Techniques—Induction melting is a more versatile tool and lends itself more readily to use with new techniques and processes. One example is the use of vibration for refining grain size (see photo).

An investigation into the effects of remelting Udimet 500 vacuum melted stock under an argon atmosphere showed that the material has stress-rupture properties practically the same as that melted and cast under vacuum. The argon technique is much cheaper and less complex than the melting and pouring of investment molds in vacuum.

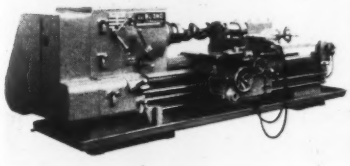
Induction melting also provides the investment caster with an opportunity to diversify his activities since it can be used for new processes such as Glascast, Investment X, refractory shell molding, and the Shaw Process with a minimum of investment for equipment. Of those new techniques, the only one that can be used with the arc furnace is Glascast.



This tracer unit doesn't trace; it simply positions the cutting tool toward or away from the rotor centerline. Then the spiral is chased

Special Lathe Whips Spiral Cutting

It gives the designer more freedom on contour shapes and will boost precision on the parts. Equally important, it breaks a production bottleneck



Between rotor jobs, the machine will be converted for standard turning

THREE-WAY SAVINGS are resulting from a new method of machining spiral-shaped compressor rotors at Roots-Connersville Blower Co., Connersville, Ind., says Richard Vreeland, chief industrial engineer.

1. The new machine, a 32-in. engine lathe, takes only 4 hours to do what formerly took 20 hours.

2. Clearance between a pair of rotors is held to 0.006-0.008 in.

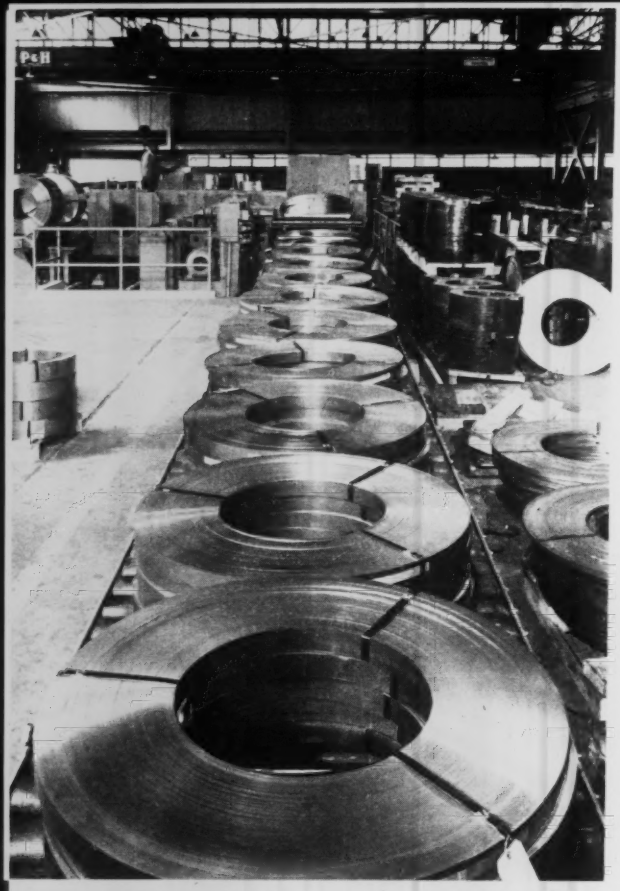
3. The exact curve wanted can be generated, and small changes in form can be easily made.

Problem — Shapers have been used to generate the spiral surfaces, but this straight-line machining limited the design of the rotor contours.

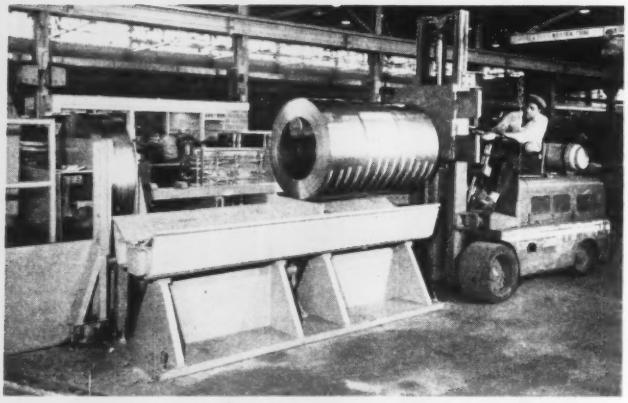
Answer—The lathe, made at R. K. LeBlond Machine Tool Co., Cincinnati, chases the spiral just as threads are chased. The lead screw that drives the tool carriage is linked, through pick-off gears, to the spindle rotation. The lead generated on the rotor can be changed by using different combinations of gears.

A special length slide and tracer unit, with template, are mounted on the cross slide. They automatically position the tool for the next chasing cut. Each feeding of the length slide moves the tracer stylus right or left slightly (from 0 to 0.070 in.) along the curved template. The template positions the tool in or out for the next cut. The template carrier is mounted on the carriage and moves with it, instead of being mounted stationary on the machine bed.

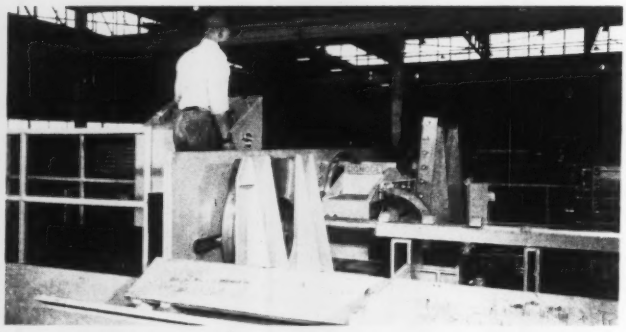
Automatic cycling and a tool release mechanism make rotor generating a hands-off operation once the setup is made.



Strapped coils come down discharge conveyor



Coils are loaded on the rack of the strapping machine



One man operates the strapper and coil manipulator

Strapper Cuts Handling Costs

Installed in a new steel warehouse, the automatic machine eliminated five men from a handling operation and doubled potential daily output of coiled strip

AUTOMATIC strapping at Caine Steel Co., Chicago, has cut labor costs over 70 per cent and practically doubled potential daily output of coiled steel strip.

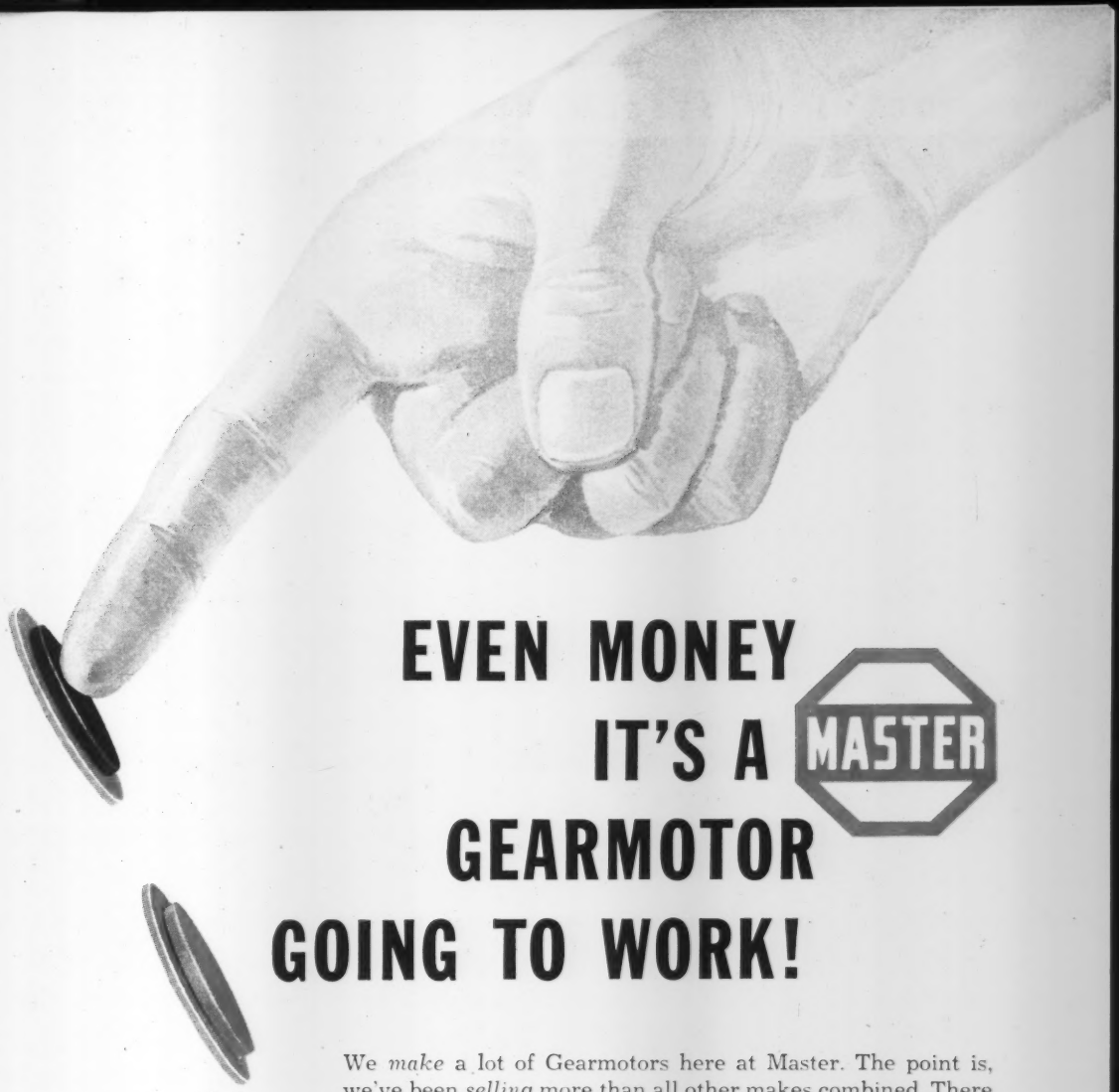
Strip steel represents a big percentage of Caine Steel's warehousing activity. Gages running from 0.015 to 0.134 in. are slit in widths of 1 to 15 in. Coil weights vary from 200 to 6000 lb.

Handling Costs Cut—In building its new warehouse, officials had one objective: Cut handling costs. Plant layout for straight-line material flow was the first step. Receiving and storage are at the south end of the plant, and work progresses through various operations to the shipping dock at the north end.

An automatic strapping machine and strip coil manipulator made by Signode Steel Strapping Co., Chicago, were installed to further cut costs. Previously, coils were unloaded from the recoilers of three slitters on a hand-pushed mandrel carriage which was then rolled to the strapping area. Seven men were needed to move, strap, and stack coils on skids. Maximum output was 75 to 100 tons in an 8-hour shift.

Minimum Labor—With the automatic strapping installation, one lift truck operator takes the coils as they come off the recoilers and loads them onto the auxiliary loading rack of the strapping machine. One man operates the strapping machine and coil manipulator which discharges the strapped coils onto a 40-ft roller conveyor. The lift truck operator who loads the strapping machine also takes the coils from the conveyor to the shipping area.

Using the lift truck and the automatic strapping equipment, two men can handle up to 200 tons in 8 hours. The average coil weighs about 500 lb.



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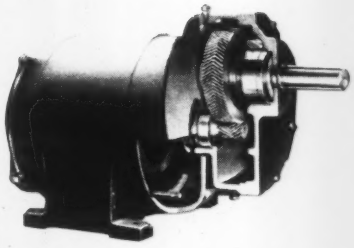

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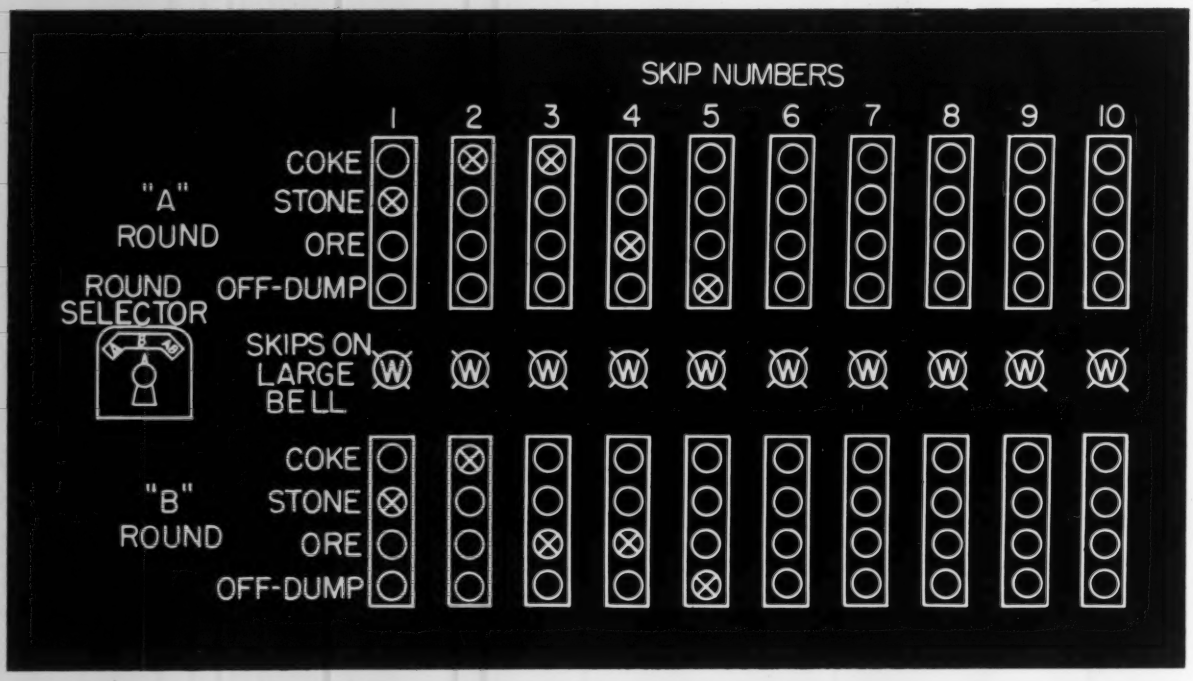


Fig. 1. Typical job for static switching—controlling a blast furnace charging program. Illustration shows typical setup buttons on a main control panel for a blast furnace skip hoist

Static Switching Catches On

By R. E. MANKO
Industry Control Dept.
General Electric Co.
Roanoke, Va.

RELAYS will take a back seat in a slabbing mill going into operation late this year. Static switches will control its acceleration, deceleration, and reversal, replacing all relays which operate during those sequences. They will replace interlocks in the regulating circuits which control voltage and load and stand guard in stabilizing and suicide circuits.

Relays will not be thrown out entirely. Circuits which operate infrequently, such as jogging, overcurrent, and overvoltage protective types, will still be switched conventionally. But even though some relay functions remain unchanged, static switching of the others will eliminate the wear and tear of millions of relay operations.

They're Versatile—The absence of wear is one of the great advantages of static switches—they have no moving parts. The number of times they operate has no effect on them. Because they are sealed in inert material, atmospheric conditions do not affect them, and dirt can't clog them. This means that they can be used in places where relays would require a pressurized control room.

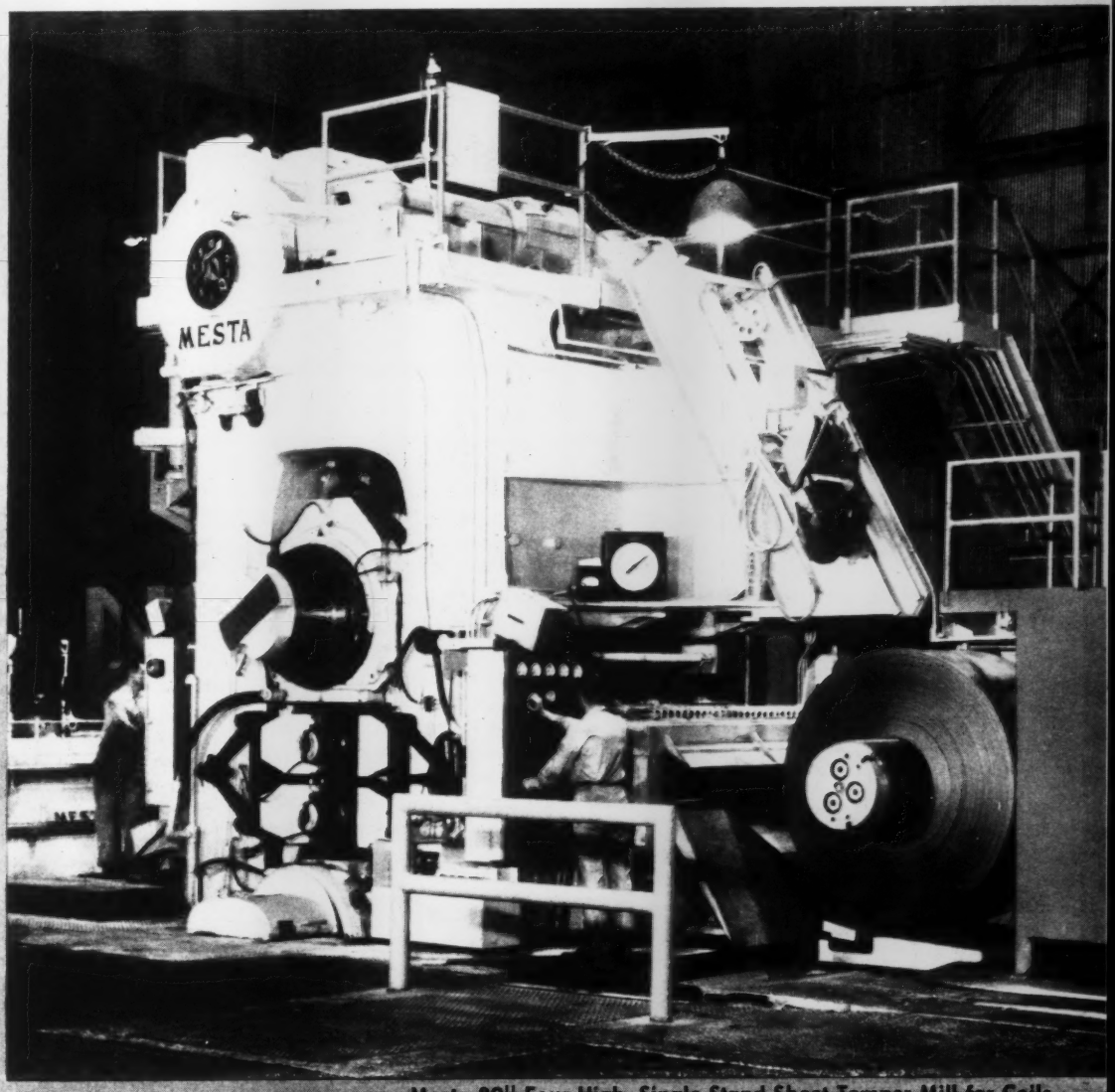
Such qualities make static switches useful in the steel plant for jobs ordinarily handled by relays. A typical application might be controlling the loading cycle of a blast furnace: The controls program the complex sequence of loading ore, stone, and coke into the skip and initiate the travel of the skip to the top of the furnace. They also initiate the dumping process, control the operation of the small bell, large bell, and stockline recorder, and protect against any out-of-sequence operation (Fig. 1).

Handle Logic Functions—Each static switching unit has as its backbone a magnetic amplifier (amplistat) or semiconductor which acts as a switch. A weak signal controls the amplifier to let all or none of a strong signal pass through it.

This switch can make the logical decisions represented by the words "Not," "Or," and "And." It also can remember whether its last position was "On" or "Off," after a power interruption. In relay terms, these "logic functions" would be represented by: 1. Normally closed interlock. 2. Normally open contacts in parallel. 3. Normally open contacts in series. 4. The sealed or latched-in device (Fig. 2).

Are Simple—The static switch is a small plug-in device. It is a typical module—a plastic block sprouting electrical connections for various input, output, power, and bias voltages. Its compactness makes it easy to nest with others

High-Speed COLD MILLS



Mesta 80[11] Four-High, Single-Stand Sheet Temper Mill for Coils

Designed and Built by MESTA

For FAIRLESS WORKS, U. S. STEEL CORPORATION

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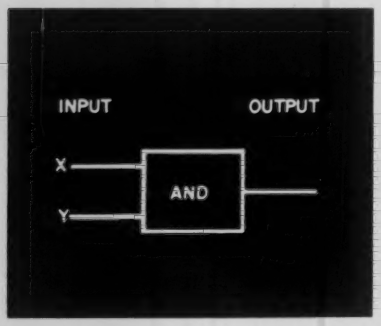
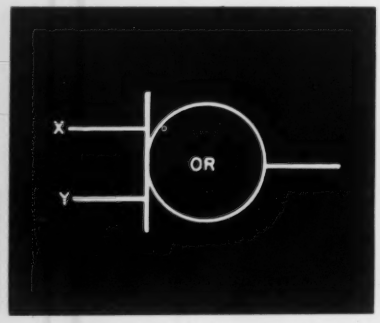
MESTA MACHINE COMPANY • PITTSBURGH, PA.

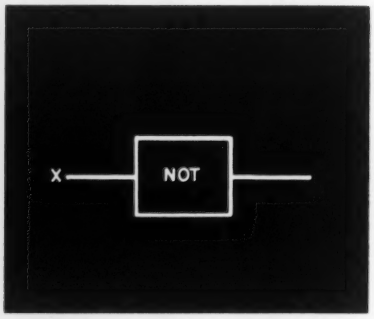
Fig. 2. Typical logic functions which the most elementary static switches represent. From such simple elements, complicated control circuits are built up



Signals X *AND* Y must both be present before the unit has an output



Either signal X *OR* Y must be present for the unit to have an output



An output is obtained only when signal X is *NOT* present

to combine a number of functions in little space. Its most conspicuous feature may be a monitor light which shows whether it is functioning properly (Fig. 3).

Have Disadvantages — For all their reliability, compactness, and versatility, static switches have limitations. Because they are low power units, amplifiers or relays are needed to operate devices requiring 0.5 volt-ampere or more. They need an external power and bias supply, so small numbers of units may be uneconomical. The switches of different manufacturers are usually not interchangeable and are difficult to combine in the same circuit.

But Uses Are Many—Some of the problems are sure to be eliminated. In the meantime, the benefits of static switching make it a natural for the control of steel plant equipment with severe repetitive operations. Examples: Shears, blooming and slabbing mills and their auxiliaries—side guides, screwdowns, tables, edgers, manipulators.

It is equally attractive for control of processes where downtime is exceedingly costly and restarting the process is complicated—tandem mills, annealing lines, galvanizing and tinning lines, and blast furnaces. In sequencing systems, such as programmed reversing mill main drive schedules, the ability of static switches to "remember" their last position is particularly valuable.

Case History—One of the earlier applications of GE static switches was on a 4-stand tandem cold mill conversion for the Indiana Harbor Works of Youngstown Sheet & Tube Co. Relays which were supplants had thread, low run, hold, and run functions.

The main motor rheostat and associated preset speed control were replaced by a static rate regulator consisting of magnetic and transistor amplifiers. The regulator serves as reference to the master pilot regulator which determines mill voltage. It also serves as reference to the winding reel forcing circuit whose function is to apply the correct quantity and polarity of inertial compensation to the reel.

The mill can be accelerated and decelerated without operation of the master control relays. Monitor lights on the switching panel give the operator a visual indication of the speed he has called for. Jog, circuit breaker, and protective relays were not converted because their operation is infrequent.

Work on the Way — The next year will see the extension of static switching systems. Among the GE installations planned are:

1. Main drive control systems for five reversing hot mills.
2. Automatic program controls for four reversing hot mills.
3. Main drive and auxiliary controls for a structural mill.
4. Automatic gage control for a hot strip mill.
5. One sintering plant control.
6. Two pipe testing systems.

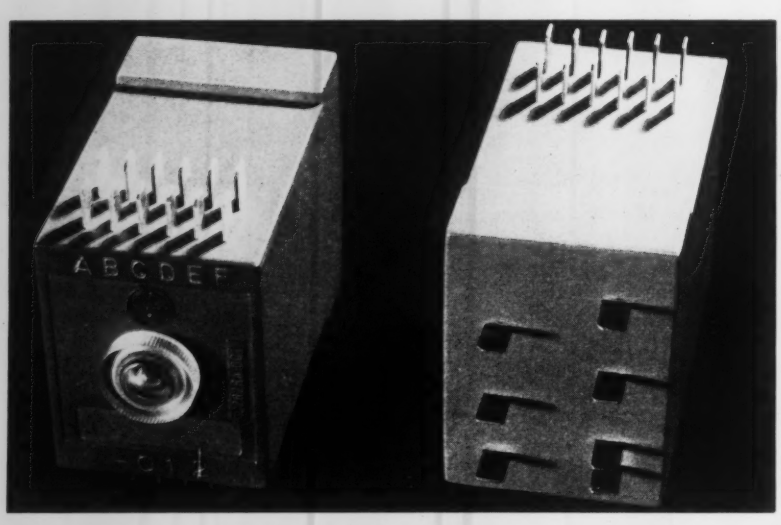


Fig. 3. A static switching unit. Visible on the module are a signal light to denote proper functioning, and plug-in leads for input, output, power, and bias voltages

Scale Is Spill-Safe

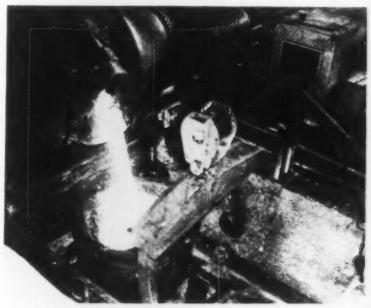
SHEFFIELD Div. of Armco Steel Corp., Houston, has simplified the weighing of hot metal charges for its open hearth furnaces. Substitution of load cells for the conventional beam and lever scale previously used has reduced the possibility of damage to weighing equipment. (Hot metal spills destroyed the beams of the old scale.) The new scale also has lowered the cost and time required to repair any damage.

The weighing system was built by the Electronics and Instrumentation Div., Waltham, Mass., of Baldwin-Lima-Hamilton Corp. It uses four B-L-H SR-4 (compression type) load cells, which support an I-beam platform on which the ladle rests. Pouring and weighing of the hot charge are controlled by an operator in a booth at the side of the weighing platform.

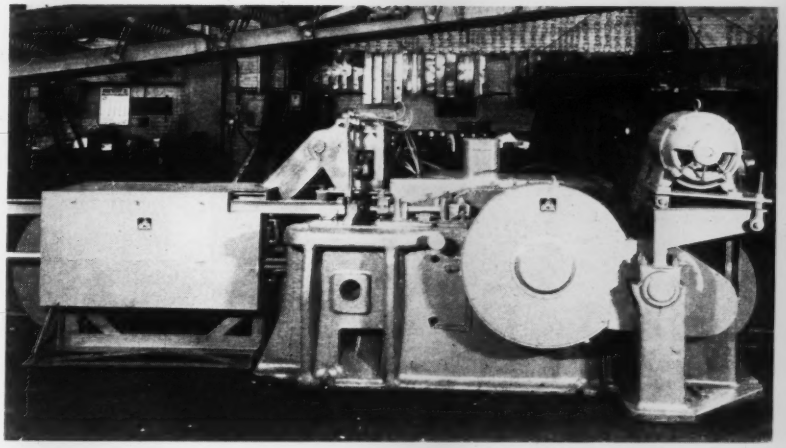
Protected—Compactness of the cells permits them to be mounted so that hot metal spills will not reach them. They are placed on pedestals in the bottom of the weighing pit, where a metal housing protects them from splatters.

Sheffield's system is simple: Four cells and a readout and recording instrument. The cells are rated at 100,000 lb each—an aggregate capacity of 400,000 lb to weigh loads of about 50,000 lb. A cell capacity much larger than the load eliminates the need for automatic controls and safety interlocks.

Weighing with the system is instantaneous, continuous, and accurate to plus 0.25 per cent (or plus 0.10 per cent on repeat weighs). The instrument shows the weight of ladle contents at any point during the pour.



Weighing hot metal at Sheffield



This upsetter is designed for high speed production. Feeding, forging, and unloading are automatic

Bolt Forging Is Automated

Sixty a minute come off this horizontal upsetter. It will handle parts ½ to 1 in. in diameter. Design is for multiple-cavity die operation at Bethlehem Steel

THE FIRST of a family of new machines converts cut blanks (bar stock) into finished forgings in a continuous operation. It's built by Hill Acme Co., Cleveland.

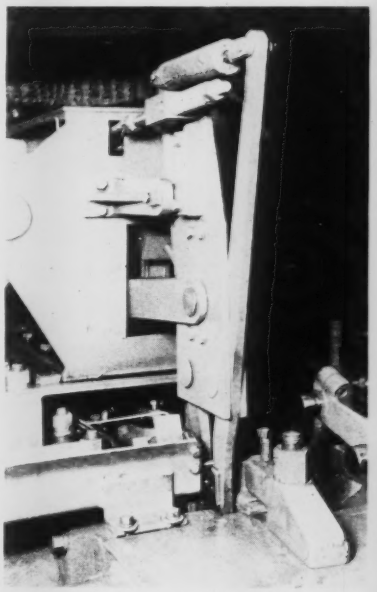
Cut lengths feed through a furnace (induction will be used with this one) and into a chute on the machine. Then the bar is pushed forward above the die. A gage controls the distance it is fed.

Finger Transfer—After the bar is in position, a multi-grooved set of fingers closes to pick it up and move it down into the first die cavity. The die halves close, and the ram advances to upset; after the ram moves away, the die halves open.

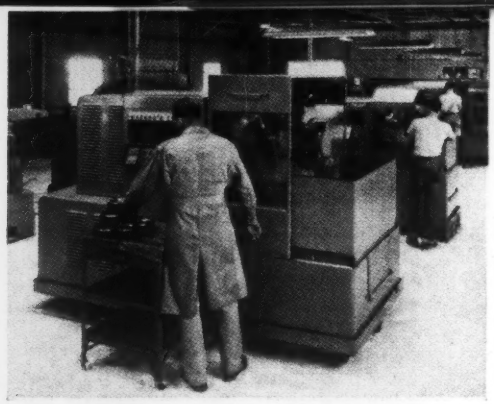
As the dies open, the fingers pick up a new part, and as they put it into the first cavity, they move the other bars through the second and third cavities and out of the machine. One finished part comes off the machine each cycle.

Complete Line—This machine is for Bethlehem Steel Co. Executives at Hill Acme say they will introduce similar models for nominal sizes of 1¼ to 5 in.

They will handle parts 6 in. and longer. Mine roof bolts which are 10 ft long and 20-ft oil field sucker rods pose no problems, say Hill-Acme engineers.



Here are the feed fingers that clamp the parts and move them through the multiple-die cavities



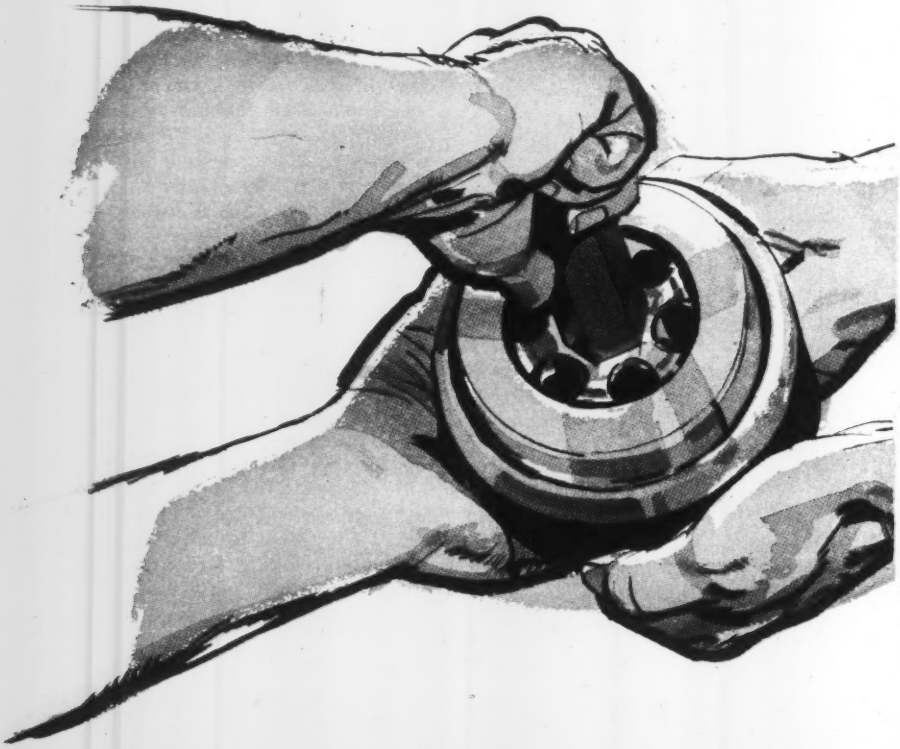
Look what

production increases

this company got with

STANICOOL
HD Soluble Oil

PRODUCTION MANUFACTURING COMPANY DOUBLED NUMBER OF THREADS CUT BETWEEN CUTTER SHARPENINGS, SCORED OTHER PRODUCTION GAINS

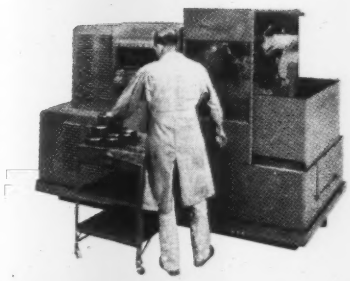


Situation: O. C. Patterson, vice president of Production Manufacturing Company, Tulsa, wanted to cut down on the number of metalworking products used in the plant. He wanted to use just one oil for cutting SAE 1025 steel, screw stock and SAE 440 stainless steel.

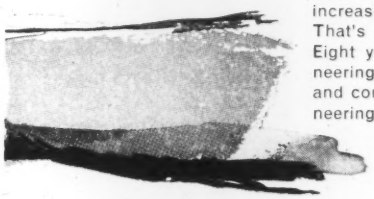
Action taken: Checking with Standard Oil lubrication specialist, R. J. MacMurray, Mr. Patterson learned about STANICOOL HD Soluble Oil. A test was set up on a Warner & Swasey automatic bar machine. Roger MacMurray helped set up equipment for the test and helped work out the right STANICOOL HD and water mixtures for the types of metal used. A 4:1 mix for 1025 steel, and up to 10:1 for other metals and jobs was decided upon.

What happened: Parts were threaded on the bar machine that Production Manufacturing had previously been unable to thread. On a new Warner & Swasey AC chucker, it was found STANICOOL made possible threading at a speed of 35 surface feet per minute. With STANICOOL HD 150 threads could be cut before the cutter needs to be sharpened. Only 75 threads could be cut before. Plant management found STANICOOL also protected work from rust while it went through many additional shop operations.

To find out more: All the facts about STANICOOL HD Soluble Oil are yours. Just call your nearby Standard Oil lubrication specialist in any of the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**



No trouble. Pressure coupling is checked by O. C. Patterson, vice president of Production Manufacturing, Standard Oil's Roger MacMurray and foreman Byron Finley. Roger MacMurray helped the men in this plant find a new route to production increases with STANICOOL HD Soluble Oil. That's his job, and he's well equipped for it. Eight years' experience in such work, an engineering degree from the University of Colorado and completion of the Standard Oil Sales Engineering School are his qualifications.



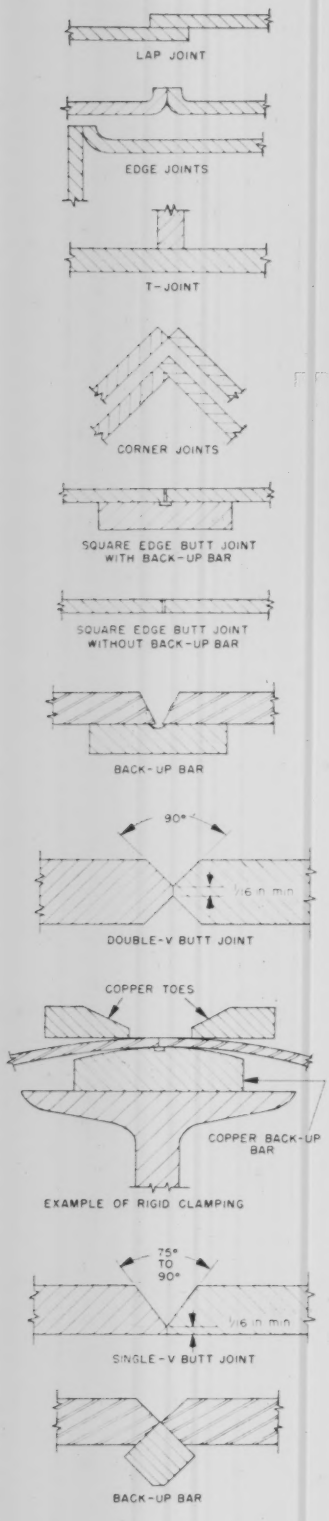
Quick facts about

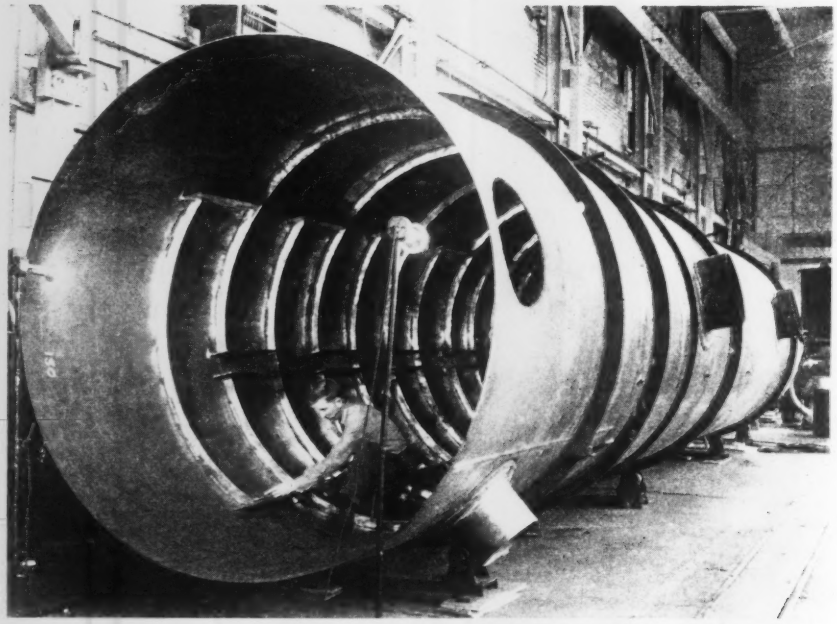
STANICOOL HD Soluble Oil

- Has E.P. and oiliness properties comparable to cutting oil.
- Contains germicide that controls bacteria build-up.
- Is nonirritating to skin.
- Protects machines, tools and work against rust and gumming.
- Will not gel in cold weather, has excellent emulsion stability.

You expect more from STANDARD and get it!

TYPICAL WELD JOINTS





This fractionating tower, used in the chemical industry, will be more than 30 ft high when erected. Phosphorized copper plates ¼ to ½ in. thick were welded with inert gas, metal arc process

How To Weld Copper

There are six methods. Properties desired in the joint will determine which to choose. Rules for the inert gas, metal arc method are given in this first article of a series

THE METHOD you choose for welding copper will determine the kind of results you get. Not all methods are suitable for one alloy type.

Besides cost, you must consider: 1. Type of alloy. 2. Characteristics of the welding method. 3. Physical factors of the joint (gage, positioning, joint size, and design). 4. Welding and jigging equipment.

This series of articles will describe such problems and their solutions.

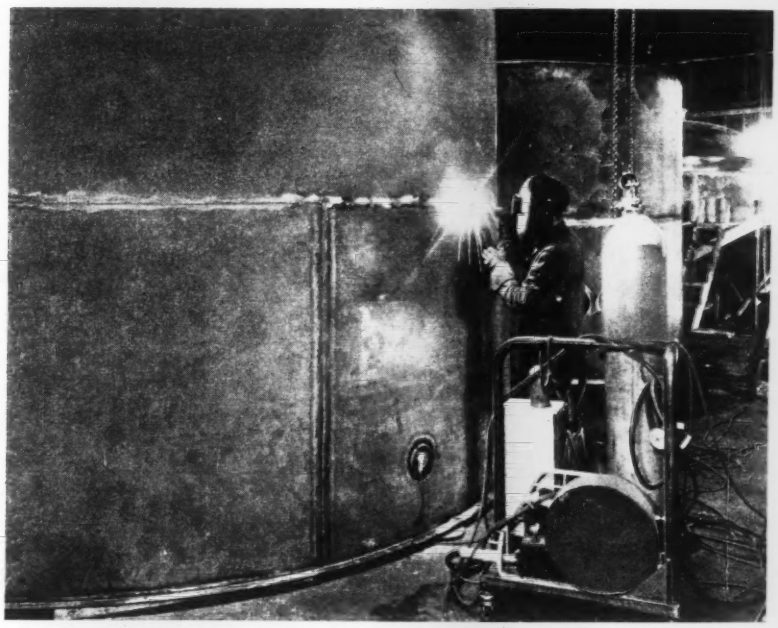
Weldability — There is a wide variety of copper and copper-base alloys. Their properties differ markedly. Some are noted for ease of forming; others have high fatigue and wear resistance, and high strength. A few have outstanding electrical and heat conductivity. Color selections range from red and gold to yellow and silver.

Compared to steel, welders find that copper and its alloys have higher thermal and electrical conductivity, higher coefficients of expansion, lower melting points, and greater fluidity at the welding temperature. The differences necessitate these changes in welding technique:

1. More space within the joint to minimize warping and strains.

2. Tackwelding to maintain alignment during welding.

3. Higher preheats and a higher



Operator is welding a hot water storage tank made of 3/16-in. silicon bronze. Tank is 15½ ft in diameter. Inert gas, metal arc process is being used

and Its Alloys

By LESTER F. SPENCER
Metallurgist,
West Allis, Wis.

rate of weld progression to shorten welding time and minimize vaporization (especially the brasses).

4. Back-up bars and, for arc welding, higher amperage for equal size electrodes and plate thicknesses. (High thermal conductivity precludes greater heat input.)

Affects Technique—In comparing resistance welding procedures with those for mild steel, the properties of copper-based materials have a great influence on technique. The electrical and thermal conductivity of copper alloys is inversely proportional to weldability. That determines secondary current. Welding pressures are lighter than those for mild steel, and welding time is shorter.

Preparation Counts—As in all welding procedures, best results are obtained by removing dirt, grease, and oxides from the edges of the base metal and from the welding rod. Black and red oxides should be pickled or ground. (About 1 in. from either side of the joint should be clean.) Use proper fluxing. Remove the slag from each welding bead to obtain maximum density in joints requiring multiple passes.

Fixtures—Successful welding depends to a large extent on the jigging and the type back-up bar used. Copper is the most satisfactory back-up material. Its high thermal conductivity prevents sticking. The chill mold effect assures a clean, smooth weld surface. Similar results can be obtained with a steel backing bar with grooved copper inserts.

Rigid clamping is a good idea, particularly with gages under 3/16 in. It prevents movement of metal during a welding operation which could cause cracking and distortion. You can use hold-down bars or rails made of steel faced with copper toes. Otherwise, try a tack weld every 6 in., especially for arc welding.

Kind of Joints—Design is a major consideration. Gage, magnitude and method of loading during service, and the cost of joint preparation are important. (Some common joint designs are shown on Page 86.)

The lap joint has square edges. It is seldom used for metal more than ¼ in. thick. A filletweld is readily completed in one pass except in heavier plate, which requires two. Edge joints are seldom used for metal thicknesses over ⅛ in. since welds are made in one pass.

The T-joint has square edges in all thicknesses. Welds are made in two or more passes for thicknesses greater than ¼ in.; those following the second pass had best be laid down as stringer beads, unless the work can be positioned for downhand welding.

For buttwelds in 0.010 in. sheet metal, edges must be clamped to a copper back-up bar, preferably grooved. Since it is difficult to maintain edge spacing in thin metal, the edges are butted and the weld made in one pass. Buttwelds in 1/64 to 3/16 in. metal can be made without backing if welding is done from both sides.

The single-V butt joint is not commonly used for metal thicknesses over ¼ in. Edges are usually butted tightly although some root spacing can be tolerated on heavier plates. The groove side is welded first. The root side is then chipped out and completed. In thicknesses over ¾ in., a double-V is preferred. You can use root spacings if necessary. The root of the first bead should be chipped out if there is any question of complete fusion. Successive beads are usually deposited on alternate sides to minimize distortion.

Controlling Physicals—Electrode composition is similar to that of the base metal. (Specific welding techniques and electrodes will be described in succeeding parts of this article.) Modifications of the

Procedures for Inert Gas, Tungsten Arc Welding

Metal Thickness (in.)	Weld Groove	Number of Beads	Bead Number	Filler Rod Diameter (in.)	COPPER D.C. Welding Current Range (amperes)	SILICON BRONZE D.C. Welding Current Range (amperes)
1/16*	Square	1		3/32	150 to 250	80 to 120
3/32*	Square	1		1/8	180 to 300	100 to 150
1/8*	Square	1		1/8	200 to 350	100 to 200
1/8	Square	2		1/8	150 to 300	100 to 150
5/32	Square	2		1/8	150 to 300	100 to 150
3/16	Square	2		1/8	180 to 350	100 to 200
3/16	Single-vee	2	1	3/16	150 to 350	100 to 200
			Root	1/8	200 to 300	150 to 200
1/4	Single-vee	3	1	1/8	200 to 350	100 to 150
			2	3/16	200 to 350	150 to 200
			Root	1/8	200 to 350	150 to 200
3/8	Single-vee	4	1	1/8	200 to 350	100 to 200
			2	3/16	200 to 350	150 to 200
			3	1/4	200 to 400	150 to 250
			Root	1/8	200 to 350	150 to 200
1/2	Single-vee	5	1	1/8	250 to 350	100 to 200
			2	3/16	250 to 400	150 to 250
			3	1/4	300 to 450	150 to 250
			4	1/4	300 to 450	200 to 300
			Root	1/8	250 to 350	150 to 200
3/4	Double-vee	6	1, 2	1/8	250 to 400	100 to 250
			3, 4	3/16	250 to 450	150 to 300
			5, 6	1/4	300 to 550	200 to 350
1.0	Double-vee	8	1, 2	1/8	250 to 400	100 to 250
			3, 4	3/16	300 to 450	150 to 300
			5, 6	1/4	300 to 550	200 to 350
			7, 8	1/4	350 to 600	200 to 400

*On backing bar; others without backing. Source: American Brass Co.

rule are followed when you want specific properties in the weld metal.

For example, you can use an aluminum bronze rod (Type E or R CuAl) to weld brass and obtain corrosion resistance, high tensile or high fatigue strength.

Miscellaneous Precautions—Volatilization (particularly with zinc) calls for adequate ventilation to remove the fumes.

Rod Recommendations for Inert Gas, Metal Arc Welding

BASE METAL	WELDING ROD
Copper	Deoxidized copper or copper-silicon
Copper-zinc	Copper-silicon
Copper-silicon	Copper-silicon
Copper-tin	Copper-silicon
Copper-aluminum	Copper-aluminum
Copper-nickel	Copper-nickel or copper-silicon
Copper-beryllium	Copper-beryllium
Iron, steel and cast iron	Copper-silicon or copper-aluminum

Source: American Brass Co.

Many of the copper alloys can be cold worked to produce high hardness and strength values. Don't forget that fusion welding softens the metal near the joint. Where harder tempers are used, calculate design strengths on the basis of an annealed structure.

Inert Gas, Metal Arc

This method uses an inert gas, like helium or argon, to protect the electrode, the base metal, and the deposited weld metal from air during the welding. The electrode can be a nonconsumable type or a consumable metal wire.

The method makes satisfactory welds in all standard types of copper. Deoxidized copper is preferred if you need maximum strength and high ductility in the weld metal.

That preference is based on the cuprous oxide phase which characterizes tough pitch copper. Oxide

migrates to grain boundaries, decreasing joint strength and ductility. The migration is a function of time and temperature. It doesn't depend upon the source of heat or arc shielding. The weld metal in deoxidized copper is sufficiently ductile. Costly hot or cold working of the joint isn't necessary.

Good Practice—A nonconsumable electrode or an AWS-ASTM RCu electrode produces joints in deoxidized copper which have substantially the same composition and physical properties as the base metal. Welding is done with straight polarity, direct current. A grooved copper back-up bar is recommended. The commercial grade of tungsten electrode is preferred over thoriated types.

The forehand position is best but a horizontal or vertical position is feasible provided there are some modifications of joint design.

The table on Page 88 suggests some good practices for buttwelds. The values are also good for filletwelds in lap or T-joints. Caution: Welds with equal legs and without undercutting cannot be made unless positioned for downhand welding.

Preferred Shield—Helium is better than argon since it improves fluidity and aids fusion in all thicknesses. It lowers the preheat temperature from 400 to 800° F, depending on metal thickness. (Preheat reduces current values and aids in controlling the weld pool. It is beneficial for welding metal thicker than 3/16 in.)

Gas flow will vary from 20 to 40 cfh. The lower rates are used for welding lighter gages and for depositing the first bead in grooves where the shield is not easily disturbed.

Current requirements for argon are usually 50 per cent higher. Preheat temperatures run from 1000 to 1400° F. Flow rate is from 15 to 30 cfh.

Combinations of helium and argon have been used effectively, the conditions for welding varying with the proportion used. Nitrogen has some promise but it is said to be of value only if it is dry, extremely pure, and used with thoriated tungsten electrodes.

Settings—The consumable electrode is particularly suited for plates thicker than 3/16 in. Filler rods are usually 1/16 in. However, 3/32-in. rods may be used to deposit finish passes in plates over ¾ in.

Welding is done with reversed polarity, direct current. Current values with 1/16-in. rods range from 270 amperes for light work to 400 amperes or more for thick plates. The 3/32-in. rod requires 400 amperes or more. Argon is preferred here—use a flow rate of 30 to 50 cfh.

Due to a high heat input, the process usually requires preheating only at the start (400° F is sufficient). In thicknesses of ¾ in. and up, it's a good idea to use a preheating torch at frequent intervals, under the joint or just ahead of the arc.

Use standard joint designs.

Alloy Procedures—A zinc-free filler metal (silicon, phosphor, or aluminum bronze) is usually required for inert gas, tungsten arc welding of copper-zinc alloys. Backing bars for root passes and a preheat may be required for heavy plates (the preheat reduces fuming).

The inert gas, shielded metal arc process can be employed on all thicknesses of ¼ in. and above. Preheating is seldom required unless the materials are of widely different thicknesses. Use silicon or aluminum bronze for filler metal—the latter is preferred for a color match.

The inert gas, shielded tungsten arc is widely employed in joining silicon bronzes. It is used to advantage in high humidity which could cause porosity with carbon arc welding. Straight polarity, direct current is preferred. Suggested welding rod sizes and current ranges are shown in the table for buttwelding (Page 88).

Electrodes—Tungsten ⅛ in. in diameter is satisfactory where the current doesn't exceed 200 amperes; 5/32 in. is used for higher amperage values. Welding can be done in all positions. Speeds are comparable to those in the carbon arc method.

For edge welds without the aid of filler metal, simply melt the edges. It is satisfactory for thicknesses up to ⅛ in.; current need not exceed 150 amperes. Corner welds can be made the same way. One edge of the joint should be lapped over the other.

Argon is regularly used with the consumable electrode for silicon bronzes. Flow rate ranges from 30 to 50 cfh. It is particularly suited for metal thicker than 3/16 in. Use reversed polarity, direct current. The 1/16-in. filler rods usually require 270 to 350 amperes; 3/32 in. rods operate with current values higher than 300 amperes.

Two Bronzes—Phosphor bronze alloys tend to hot shortness and the formation of oxides. With care, satisfactory joints with minimum porosity can be obtained with an inert arc. Other recommendations: Standard joint designs; helium or argon (helium is slightly preferred); welding in the flat position.

Although the thermal conductivity of phosphor bronze is not as high as copper, preheating (400 to 800° F) is usually employed on thicknesses over ½ in. It helps to keep current requirements moderate. A copper-silicon electrode is normally used.

Aluminum bronzes are difficult because a refractory slag forms. The procedure is carefully controlled to prevent slag inclusions. The tungsten arc is successful with a bare aluminum bronze filler rod. Straight polarity, direct current, or alternating current may be used.

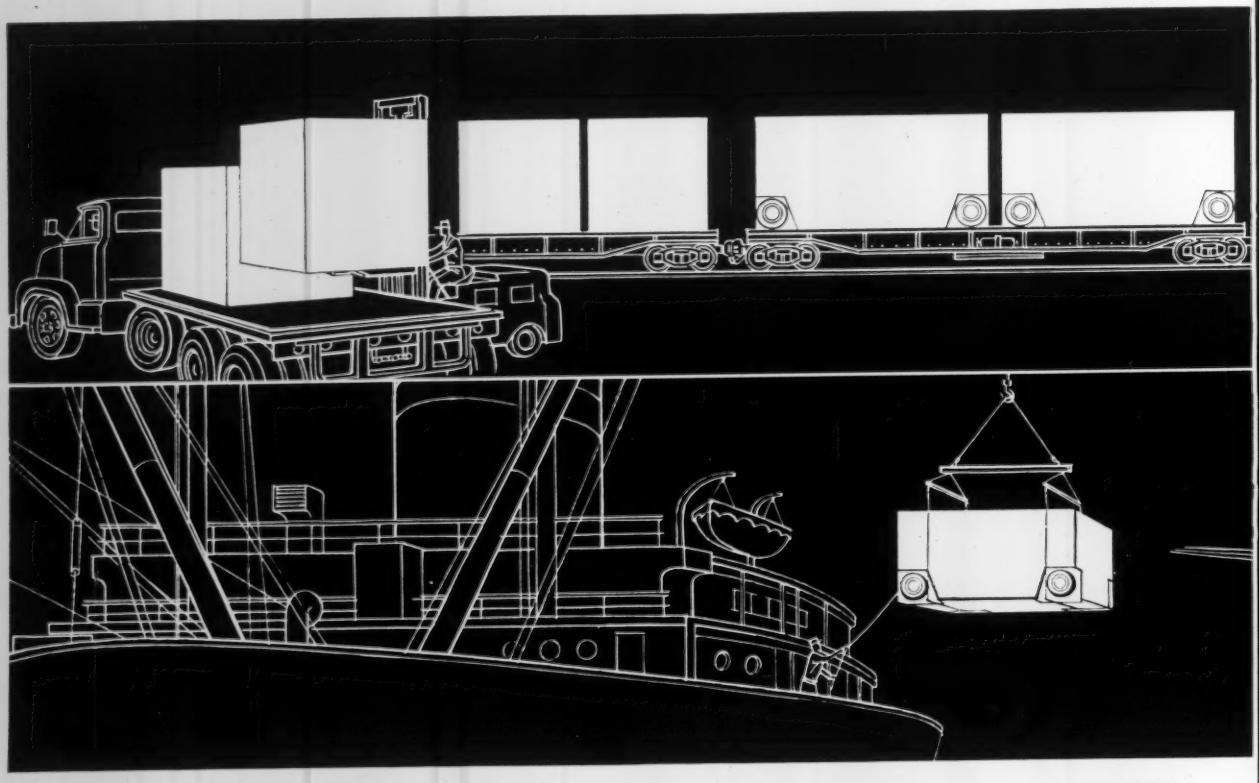
Aluminum bronze consumable electrodes are used for the heavier gages. Procedures are identical to those employed in welding silicon bronze alloys.

The tungsten arc is used extensively for the cupro-nickel alloys. Electrode material contains 70 per cent copper and 30 per cent nickel. Helium or argon may be used with direct current (straight polarity) or alternating current. With the latter, use standard transformers with continuous high frequency stabilization, or high open circuit voltage transformers. The standard transformer type should be used with argon only; the latter may be used with helium or argon.

• An extra copy of this article is available until supply is exhausted. Parts II through V will appear in succeeding issues. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.

For whatever you *will* make . . .

N-A-X® HIGH-STRENGTH STEELS PROVIDE STRENGTH WITH LIGHT WEIGHT



Transportation today stands on the threshold of a major breakthrough . . . in the new direction of reduced handling for faster, easier distribution.

Piggyback is here to stay, so is "fishyback" and "birdyback." Sturdy, versatile steel containers move quickly and economically from flatcar to trailer—from ship to shore—even from ground to air.

Already N-A-X HIGH-STRENGTH steels are playing a leading role in this modern transportation trend. By providing the extra strength and corrosion resistance to assure long container life, plus light weight for economical handling and shipping, N-A-X HIGH-STRENGTH steels continue to accelerate transportation progress.

Check These Important Advantages for Your Job: N-A-X HIGH-STRENGTH steels—both N-A-X HIGH-TENSILE and N-A-X FINEGRAIN—compared with carbon steel, are 50% stronger • have high fatigue life with great toughness • are cold formed readily into difficult stampings • are stable against aging • have greater resistance to abrasion • are readily welded by any process • offer greater paint adhesion • polish to a high luster at minimum cost.

Although N-A-X FINEGRAIN'S resistance to normal atmospheric corrosion is twice that of carbon steel, N-A-X HIGH-TENSILE is recommended where resistance to extreme atmospheric corrosion is important.

For whatever you make, from steel boxes to boxcars, with N-A-X HIGH-STRENGTH steels you can design longer life, and/or less weight, and economy into your products. Let us show you how.

N-A-X Alloy Div., Dept. B-7
Great Lakes Steel Corp., Detroit 29, Michigan

☐ Please send me 12-page illustrated technical catalog on N-A-X HIGH-STRENGTH steels.
☐ Please have your representative contact me.

Name_____ Title_____

Company_____

Street_____

City_____ Zone____ State_____

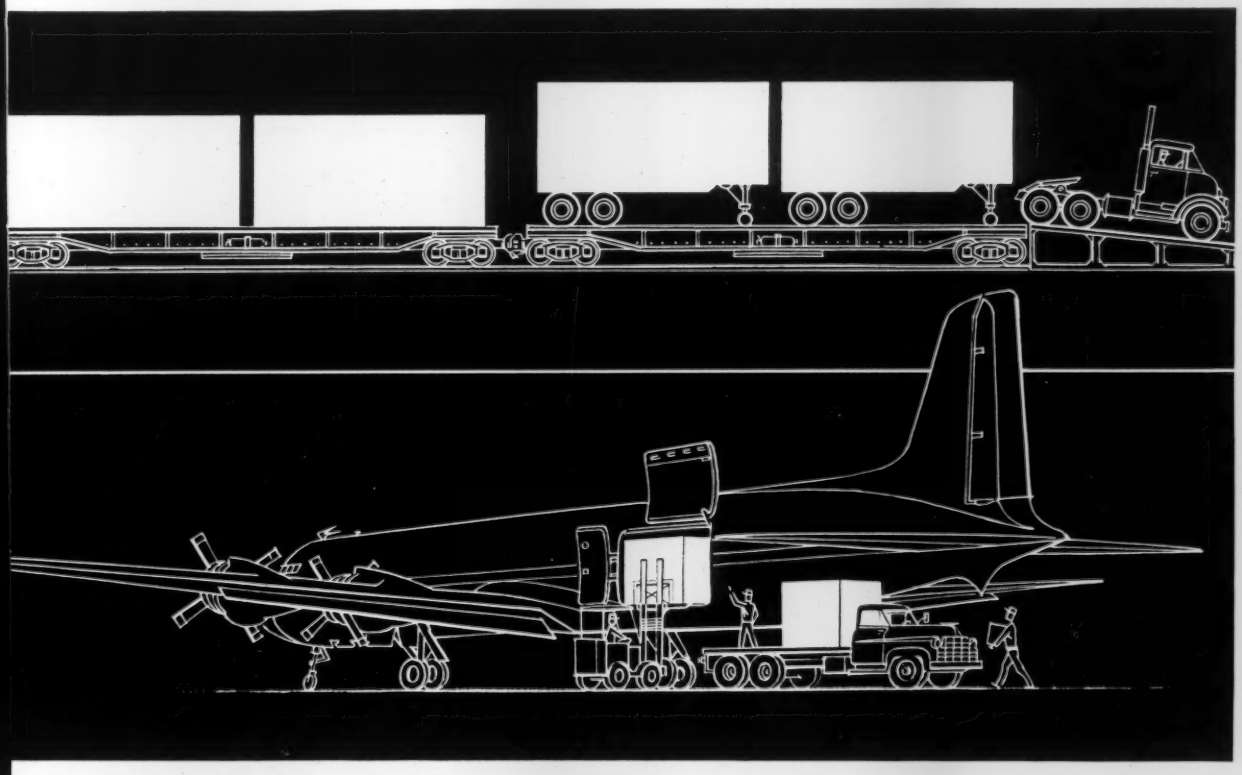
N-A-X® HIGH-STRENGTH STEELS

N-A-X Alloy Division, Dept. B-7

GREAT LAKES STEEL CORPORATION

Detroit 29, Michigan • Division of

NATIONAL STEEL CORPORATION

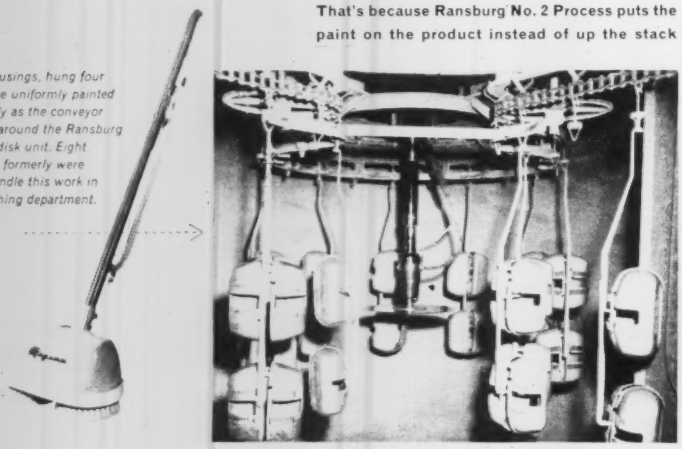


Regina Reports 50% Paint Saving with RANSBURG NO. 2 PROCESS

Electrostatic Spray Painting

That's because Ransburg No. 2 Process puts the paint on the product instead of up the stack

Aluminum housings, hung four to a fixture, are uniformly painted electrostatically as the conveyor makes a loop around the Ransburg reciprocating disk unit. Eight hand sprayers formerly were required to handle this work in Regina's finishing department.



The Regina Corporation, Rahway, N. J., replaced hand spray with Ransburg No. 2 Process to paint their twin-brush Floor Polisher and Scrubber, and their Electrikbroom.

Now, a single reciprocating disk unit automatically handles the work which formerly required eight hand sprayers. Even with increased production, Regina is using 50% less paint. Quality of the work is improved with maximum uniformity on all parts.

NO REASON WHY YOU CAN'T DO IT, TOO!
Want to know what Ransburg No. 2 Process will do for you in your finishing department? If your present production justifies conveyorized painting, let us prove the many cost-saving benefits which can be yours. Write for our No. 2 Process brochure which pictures many on-the-line examples of electro-coating on a wide variety of products, and describes our free survey service.

Ransburg ELECTRO-COATING CORP.
Indianapolis 7, Indiana

RANSBURG

Paint Tray Idea

Paint passes through holes in expanded metal. Maintenance is held to minimum

EXPANDED metal makes an improved tray for parts being painted at Convair Div., General Dynamics Corp., San Diego, Calif.

Panels of the mesh are spot-welded to $\frac{3}{4}$ in., angle iron frames. Each weighs 9 lb and is moved by hand.

EXPANDED METAL
. . . holds parts for F102A fighter

Part Handling—The trays hold details for the F102A supersonic all-weather interceptor. A conveyor which holds 62 trays carries them through two automatic spray booths and two drying ovens.

Parts on trays moved by hand are manually spray painted and placed in a rack to dry.

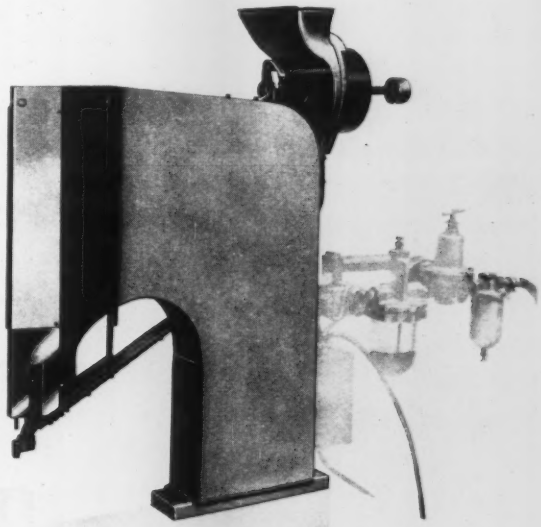
Paint passes through the trays to the booth waterfall. The expanded metal permits a more even flow of spray and resists accumulations.

Trays are rotated for stripping. Convair feels that maintenance is held to a minimum.

More Examples—Expanded metal is also widely used for baskets. It allows debris to fall through yet retains the parts. The same basket can be used to dip the parts in cleaning, treating, or lubricating solutions.

Expanded metal is furnished by Wheeling Corrugating Co., Wheeling, W. Va.

Riveting Machine Operates on Shop Air Lines



Model 56 is a bench-type machine only 3½ in. wide. It will set tubular steel rivets from 0.058 to 5/32 in. in diameter and from 3/32 to 3/4 in. long on centers 3/4 in. and farther apart.

The riveter can be used with inline slide fixtures or rotary transfer tables for progressive, high speed assembly operations. The machine can also be used in job shops where its compactness and flexibility are valuable.

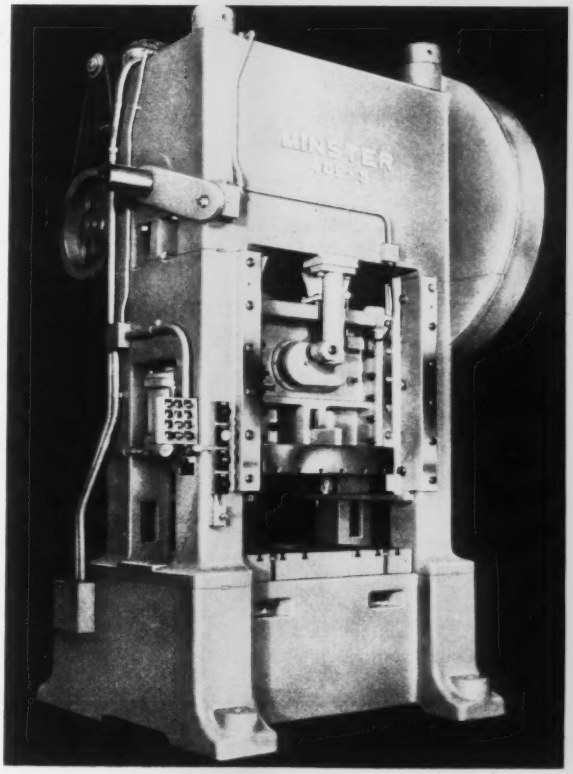
The machine will operate on 60 to 150 psi air lines. A pneumatic cylinder drives the setting tool through a toggle linkage. High cycling speeds are limited only by the rate at which rivets will drop from the feed rail into the jaws.

Because the machines are controlled by pneumatic valves actuated by solenoids, they can be arranged for automatic cycling and part feed.

A rotary hopper that insures a continuous supply of rivets to the head is standard equipment, although other types, such as vibrating hoppers, can be used.

The riveters have a throat depth of 9 in. and a 2-in. stroke. Machines can be connected to a manifold when used in multiples. *Write*: Milford Rivet & Machine Co., Milford, Conn. *Phone*: Trinity 8-1761

Blanking Press Has a Capacity of 400 Tons



The 40E-9 is a heavy duty, straight side machine built especially for heavy material blanking.

It can exert the tremendous force needed for blanking high shear strength material up to ½ in. thick. Its rigidity, solidity, and mass enable it to withstand the intense shock of impact and the sudden release of forces as the material fractures.

The press is single geared and has a single end drive. It makes 35 to 120 strokes a minute, depending upon stroke length.

Continued alignment under constant heavy impact and fracture conditions is assured by the rigid, four-piece tierod construction.

A huge, full eccentric crankshaft applies force through heavy twin connections. These maintain slide parallelism and also distribute the forces evenly.

Upper connection tiebolts are shrunk on electrically. For proper preloading, the large diameter frame tierods are shrunk the same way.

Massive connection screws are used. The slide is designed for unusual rigidity and is guided by eight bronze-lined ways.

A choice of operating speeds is provided by a patented, combination air friction clutch and brake unit within the main drive gear on the eccentric crankshaft.

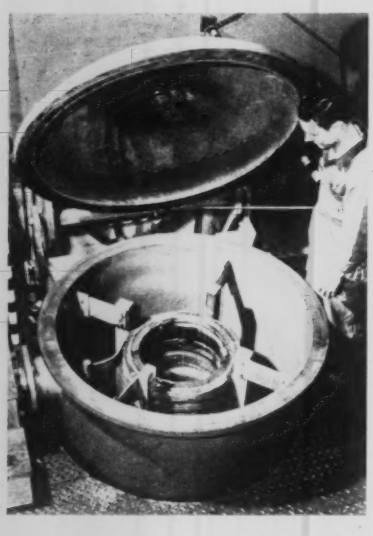
A recirculating lubrication system supplies a constant protective film of oil on all pressure or bearing surfaces. *Write*: Minster Machine Co., Minster, Ohio. *Phone*: 194

NEW PRODUCTS and equipment

Sintering Furnaces

These vacuum furnaces are heated by induction. Temperatures of 3600 to 4700° F make them suitable for sintering materials such as tantalum compacts for electrical capacitors or special, high purity carbides.

Graphite, molybdenum, or tantalum (depending on the application) is used to create high temperature around the material being sintered.



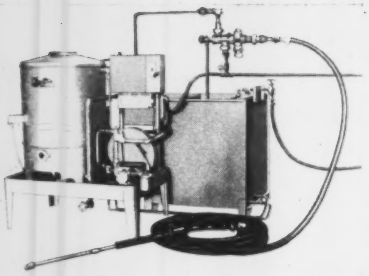
Vacuums of 0.1 micron and less are developed and maintained by combination pumping systems.

Uniform temperature work zones from 3 in. in diameter and 6 in. high to 8 in. in diameter and 12 in. high are available. *Write*: F. J. Stokes Corp., 5500 Tabor Rd., Philadelphia 20, Pa. *Phone*: Cumberland 9-0100

Combination Cleaner

Model CS 628 combines steam and hydraulic jet cleaning. It provides steam cleaning for high impact, heavy duty cleaning on close surfaces, or a hot hydraulic jet stream for cleaning distant surfaces.

Used as a steam cleaner, it produces 280 gallons per hour at 90 to 100 psi. Maximum volume and pressure are usable at close range through a single nozzle. The cleaner can be converted to one or two gun operation at 140 gph per gun.



As a hydraulically operated cleaner, the unit delivers 500 to 600 gph at 220 psi and 210° F. A ¾-hp motor is used. *Write*: Clayton Mfg. Co., Box 550, El Monte, Calif. *Phone*: Atlantic 6-1161

Welding Torch

No. 43 is used for construction work and industrial welding and cutting applications. It will operate on high, medium, or low pressures. A wide range of styles and sizes of tips is available.

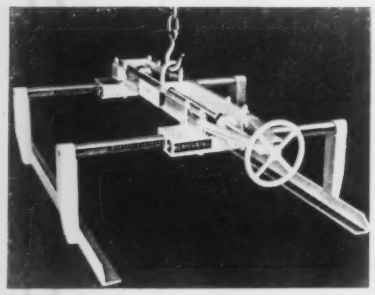
The torch handle is made without solder. All joints are sealed with O rings.

A corrugated thread is used in the packing area. This prevents end play and assures positive, sensitive, and accurate adjustments of flame. *Write*: Harris Calorific Co., 5501 Cass Ave., Cleveland, Ohio. *Phone*: Woodbine 1-5700

Sheet Lifters

From 2 to 5 tons can be handled by these sheet lifters. The smallest model lifts sheets from 22 to 48 in. wide, in loads up to 8 in. thick. It can operate with a clearance of only 6½ in. on each side of the sheets.

The largest lifts sheets from 24 to 60 in. wide, in loads up to 25 in. thick.



Lifters are stocked in lengths of 5, 6, 7, 8, and 9 ft. Arms are moved by a handwheel or chain or by a 1-hp motor. *Write*: Heppenstall Co., Fifth Avenue and 16th Street, New Brighton, Pa.

Floor Sweeper

Hydra-Sweep 51 has an adjustable side broom that enables it to sweep aisles from 36 to 51 in. wide. Another side broom can be added to bring the sweeping width up to 66 in.

Brooms operate at a constant speed.

At travel speeds up to 8 mph, over 100,000 sq ft of floor space can be swept in an hour.

The minimum floor clearance of 3 in. enables the sweeper to pick-up 2 x 4s, newspapers, tin cans, and pop bottles. A high vacuum collecting system draws dust from the enclosed brush compartment through a primary cyclone separator into an easily cleaned filter.

The sweeper is powerful enough to double as a tow truck. *Write*: Dept. H-38, Industrial Sweeper Co., 2508 S. Main St., South Bend 23, Ind. *Phone*: Atlantic 9-2449

Fume Washer

Acid-laden or harmful vapors and plating fumes are removed from air exhausts by this lightweight fume washer. It resists corrosion because it is made of polyester reinforced with glass fiber.

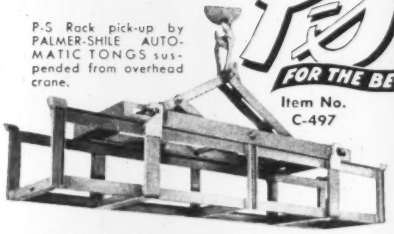
Because it is light, the unit can be installed on a roof. The motor and blower are housed separately. The exhaust blower creates a powerful suction which draws fumes into the washer receiver shell. The

YOUR WAREHOUSE CAN LOOK LIKE THIS...

HANDLE, TIER *and* STORE ECONOMICALLY, EFFICIENTLY *and* SAFELY *with*

CONSULT P-S FOR THE BEST

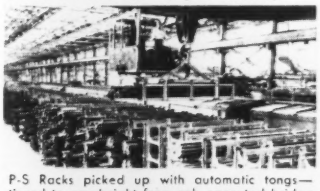
PORTABLE *Heavy Duty* BAR RACKS



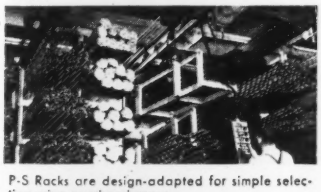
P-S Rack pick-up by PALMER-SHILE AUTOMATIC TONGS suspended from overhead crane.

Item No. C-497

P-S Racks have flush top and bottom, with full wrap around crane bars. In addition to the full wrap around crane bars, an extra thickness of lift bar is welded for strength and safety.



P-S Racks picked up with automatic tongs—tiered to any height from cab operated bridge crane.



P-S Racks are design-adapted for simple selection using overhead crane.

Why do it the OLD WAY? . . . an investment in ultra-modern Palmer-Shile portable heavy duty bar racks will pay off many times over by eliminating inefficient, money-wasting stock handling and storage methods.

Besides making it so simple, so convenient and safe to tier and store all kinds of bar, sheet, pipe, tubing and other stock, P-S racks also act to prevent damage to stock from the time it arrives at your plant through every handling and storage step.

Flush bottom insures sturdy, rigid, safe tiering—rack upon rack. Heavy gauge steel safety stacking pockets on rack corners eliminate danger of rack slipping or falling. Double thickness lifting lugs welded to wrap around channels, for maximum strength and safety.

Engineered-built to your size and weight specifications. Let our engineers explain how P-S racks add to the efficiency and economy of your manufacturing operations.

DESIGNED AND MANUFACTURED BY

Palmer-Shile Co.

16025 Fullerton Avenue, DETROIT 27, MICHIGAN

126 Dartmouth St., BOSTON 16, Mass., COmmonwealth 6-0570 • 1209 Burlingame Ave., BURLINGAME, Calif., Diamond 2-0823 • 15 South Austin Blvd., CHICAGO 44, ILL., AUstin 7-8599 • 857 Leader Bldg., CLEVELAND 14, Ohio, SUperior 1-3235 • 2855 W. Eighth Ave., DENVER, Colo., ALpine 5-3984 • 202 Genesee Bank Bldg., FLINT, Michigan, CEdar 8-6881 • 2609 S. Broadway, FORT WAYNE, Indiana, KEnmore 5408 • 1224 No. Capitol Ave., INDIANAPOLIS 2, Indiana, MElrose 5-2587 • 6440 Fleet St., LOS ANGELES 22, Calif., RAymond 3-3733 • 647 W. Virginia St., MILWAUKEE 4, Wis., BRoadway 1-9860 • 5107 Columbia Ave., ST. LOUIS 9, Mo., PRospect 1-1474 • 199 Main St., WHITE PLAINS, N. Y., White Plains 6-1354.

NEW PRODUCTS and equipment

fumes circulate through rotary action at controlled velocities while their solids and contaminates are washed into the water reservoir by a spray system. *Write*: Line-O-Coat Co., 1230 S. Santa Fe Ave., Compton, Calif. *Phone*: Nevada 6-5391

Punch Press

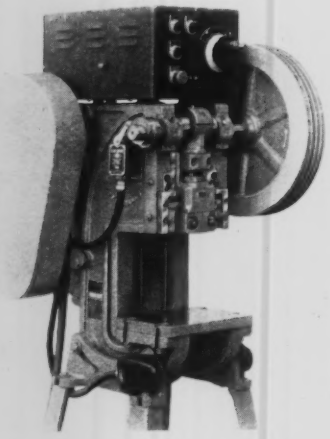
The Electro-Safe has a capacity of 8 tons in trimming, forming, drawing, embossing, coining, staking, and assembly. Its ram is positioned with an inch button.

An electronic switching arrangement permits cycling the ram to start and stop in any position.

To use the press for single-trip operation, two widely separated hand controls must be pressed and held until the ram reaches the bottom of the stroke. The operator cannot fasten one control in the down position.

A motor with high starting torque delivers power directly to the crankshaft. In single-trip work, the motor goes dead after every cycle, so that double tripping cannot occur.

A heavy-duty brake is applied automatically when power is disconnected or fails. The press can be stopped instantly at any point in the stroke cycle by pressing a button. *Write*: Kenco Mfg. Co., 5211 Telegraph Rd., Los Angeles 22, Calif. *Phone*: Angelus 1-7955



Temperature Control

Model MFS will sense, indicate, and control processes and appliances from −30 to 1100° F.

The instrument has been designed to prevent reading errors. The dial area is large. A special magnifying setting pointer is

equipped with two hairlines for parallax sighting. Dial colors provide the greatest possible contrast.

A flange seals against dust and moisture. *Write*: Partlow Corp., 505 Campion Rd., New Hartford, N. Y. *Phone*: 2-5105

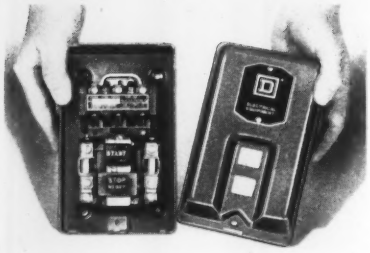
Manual Starters

Motors up to 7½ hp are controlled by this line of Class 2510 starters in NEMA sizes 0 and 1.

A toggle-action operating mechanism gives positive snap-action opening and closing of the contacts with no dead center position.

Trip-free overload protection is provided by melting alloy type relays. Self-centering pushbuttons show when there is an overload.

The starters come in two, three,



and four pole versions. They are rated at up to 600 volts ac or 250 volts dc. *Write*: Square D Co., 4041 N. Richards St., Milwaukee 12, Wis. *Phone*: Edgewood 2-2000

Jet Cleaner

Scalding hot water, saturated steam, or a mixture of both at pressures up to 185 psi are provided by the Hydro Steam-Jet cleaners.

Separate lightweight lances direct the scrubbing jets of steam and hot water to the equipment or surfaces being cleaned.

The nozzle is easily rotated to reach otherwise inaccessible areas.

Detergents or solvents are automatically added under fingertip control.

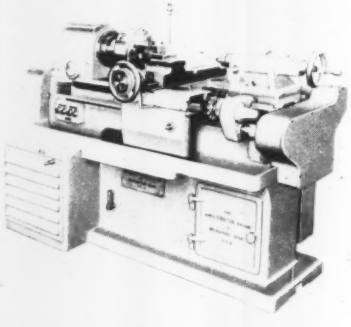
The unit is on 3 phase, 60 cycle circuits (22, 440, or 550 volts). *Write*: Dept. SG, Pantex Mfg. Corp., P. O. Box 660, Pawtucket, R. I.

Threading Lathe

Model B is a single point machine which can produce internal threaded pieces up to 10 in. in diameter and external threaded pieces up to 6 in. in diameter.

Capacity between centers is 24 in. Maximum swing over the cross slide is 6 in. and 14 in. over the bed.

A skip-feed mechanism produces multistart threads of 2, 3, 4, 6, 8,



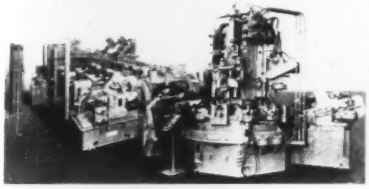
and 12. It also controls the acceleration rate of feed. *Write*: James Coulter Machine Co., 136 James St., Bridgeport, Conn. *Phone*: Edison 3-1979

Machining Line

Automotive axle housings are machined by this unit at the rate of 75 an hour. It combines and synchronizes a center-column type machine tool with an inline transfer machine.

The center-column machine has four stations and is 76 in. in diameter. It has equalizing clamping fixtures that centralize the housing banjo sections and assure that all portions of the part will clean up in subsequent machining operations.

A hydraulic-powered device at the unloading station of the machine automatically unloads the semifinished machined housings, rotates them 180 degrees to dump out the chips, and places the part on the transfer mechanism of the segmented inline machine. The machine is 35½ ft long, has 17 stations.

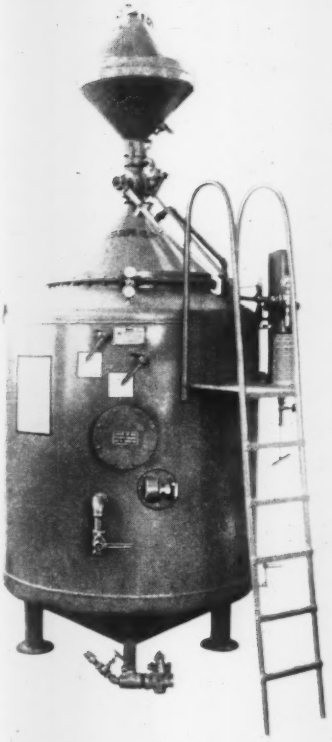


The transfer machine is made up of five separate double-end machining segments, each with its own controls. *Write*: Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich. *Phone*: Lorain 7-0123

Acetylene Generator

Oxweld MP-11 will produce 1000 cu ft of medium pressure acetylene an hour. Delivery rates up to 2000 cu ft an hour can be obtained over short intermittent operating periods.

Carbide capacity is 500 lb. An automatic signal system (howler and indicator lights) gives audible and visual warnings if minimum carbide supply, water level, or water temperature should deviate from normal.



With standard regulating equipment, the generator can be used to supply low-pressure acetylene to a piping system.

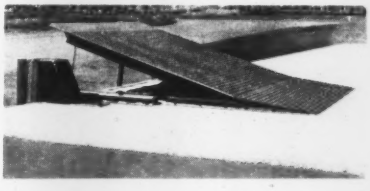
The generator is equipped with an automatic carbide and water shut-off system, a hydraulic back-pressure valve, and relief valves.

Acetylene pressure is rated at 13 psi. *Write*: Linde Co., division of Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 6-5100

Dock Board

The Hi-Lo is an automatic dock board that can be installed without expensive alterations. It is simply bolted to the top of the truck dock.

The backing truck lowers the ramp to the working position. After loading is completed, the ramp returns to its original position, ready to service the next carrier. No attendant is needed.



The ramp section also tilts automatically to compensate for uneven truck beds.

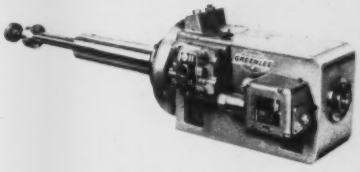
Standard models are 6 ft wide and 8 to 10 ft long with a roll-over capacity of 12,000 lb. *Write*: Kelley Co. Inc., 2111 W. Mill Rd., Milwaukee 9, Wis. *Phone*: Flagstone 2-1000

Boring Machine

Model S-7 Hydro-Borer is designed for mounting on workholding fixtures or large assembly jigs. It has a 6-in. stroke.

Feed per revolution is 0.0035 in., reducible to 0.002 in.

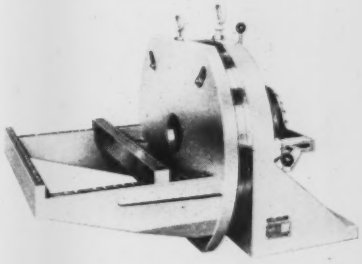
The unit is 34½ in. long, 7¾ in. high, and 5½ in. wide. It consists of a cylinder housing, oil reservoir, bearings, boring spindle assembly, control valve, and spindle drive assembly. The spindle diameter is 1¾ in. with a No. 3 Morse taper.



Manual, solenoid, or air-operated controls can be used with the unit. *Write*: Greenlee Bros. & Co., Rockford, Ill. *Phone*: 3-4881

Trunnion Indexes

Model 300 has roller bearings which give smooth and easy rotation for the heavy loads handled on radial drills and boring mills.



Face plates up to 30 in. in diameter can be used. *Write*: Johnson & Bassett Inc., 114 Foster St., Worcester, Mass. *Phone*: Pleasant 5-1216

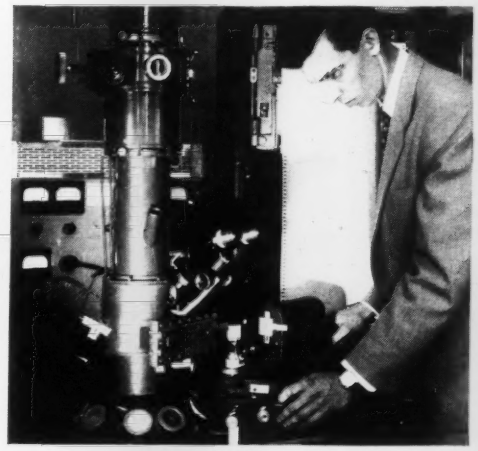
When you buy from U. S. Steel

STEEL + PLUS **IN ACTION: FACILITIES**

The purest commercial steel obtainable is in these parts for a 100", double-focus, mass spectrometer magnet. We made the steel, poured it in one huge ingot, formed it and machined it. Both parts were machined flat and parallel with less than a .001" variation. The ends are within .002" of a true square. The surfaces were polished to a 30-micro-inch finish! It took complete steel-making facilities to meet these "almost impossible" specifications required by the Argonne National Laboratory.

American Bridge • American Steel & Wire and Cyclone Fence • Columbia-Geneva Steel • Consolidated Western Steel • National Tube
Oil Well Supply • Tennessee Coal & Iron • United States Steel Homes • United States Steel Products • United States Steel Supply
United States Steel Export Company • Universal Atlas Cement Company

you get STEEL + PLUS



STEEL + PLUS IN ACTION:
RESEARCH

The head of a pin would appear about 47 feet in diameter if examined under this instrument. It's an X-ray probe micro-analyzer now in use at U. S. Steel's Fundamental Research Laboratory at Monroeville, Pa. U. S. Steel's Research teams use it to study the microstructure and behavior of steels for today's *and tomorrow's* special uses.

STEEL + PLUS IN ACTION:
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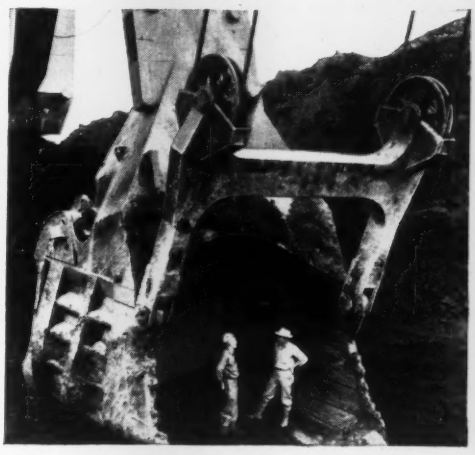
"Practical Dreamer" is the title of U. S. Steel's technicolor movie promoting steel products for modern kitchens. It will be seen by thousands of kitchen-planners at theaters, clubs, and on TV. Result: Increased demand for the kitchen products made by our customers.



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NEW literature

Write directly to the company for a copy

Welded Steel Pipe

Bulletin SWP-14457, 8 pages, describes pipe with diameters from 6 to 36 in. and wall thickness of 9/64 to ½ in. Product Information Service, Armco Drainage & Metal Products Inc., Middletown, Ohio.

Pipe Welding

This 12-page bulletin tells how to get a sound root pass weld with the aid of a consumable insert when only one side of the weld is accessible. Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.

Fire Protection

Portable fire extinguishers, built-in carbon dioxide fire extinguishing systems, smoke detecting systems, and rate-of-rise fire detecting systems are depicted in a 12-page bulletin, P-40. Dept. A, Walter Kidde & Co. Inc., Main Street, Belleville 9, N. J.

Metering Pump

Bulletin 1157, 2 pages, specifies capacities, pressures, and materials of construction of a metering pump with a diaphragm liquid end. Milton Roy Co., 1300 E. Mermaid Lane, Philadelphia 18, Pa.

Pump Castings

This 20-page bulletin depicts pump castings and the various pump types that use Meehanite castings. Tables illustrate property evaluations made from tests covering wear, resistance to acid corrosion, impact, and erosion. Meehanite Metal Corp., 714 North Ave., New Rochelle, N. Y.

Contactors and Relays

GEA-6621 is a 32-page catalog which provides selection and application data for general purpose, mill-type, and time delay contactors, and several types of relays including general purpose, timing, overload, accelerating, and decelerating units. General Electric Co., Schenectady 5, N. Y.

Protective Coatings

Catalytic coatings that dry in 5 to 10 minutes are described in this 8-page bulletin. Industrial Finishes Co. Inc., 1119 Land Title Bldg., Broad and Chestnut Streets, Philadelphia 10, Pa.

Squaring Shears

Foot operated shears for handling up to 16 and 18 gage metal are described in Bulletin 80-FC, 12 pages. Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11, N. Y.

Induction Heaters

Bulletin 12B6430B, 12 pages, describes high frequency, vacuum tube induction heaters (output ratings from 10 to 100 kw) and motor generator induction furnaces with output ratings from 15 to 1250 kw. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Tubular Steel Products

Seamless and welded tubing and pipe, seamless welded fittings, and forged steel flanges for process industries are covered in Bulletin TB-417, 16 pages. Tubular Products Div., Babcock & Wilcox Co., Beaver Falls, Pa.

Brass Valves

This 20-page bulletin, R-6, lists application data and sizes of valves, accessories, and fittings for refrigeration and air conditioning. Superior Valve & Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26, Pa.

Surface Grinders

Construction details of open side, horizontal and vertical spindle surface grinders are covered in this 29-page bulletin. Magnetic chucks and double housing surface and way grinders are also described. Hill Acme Co., 1201 W. 65th St., Cleveland 2, Ohio.

Copper and Its Alloys

This 28-page specification index, B-34, lists generally used alloys and products of the company with the specifications of several agencies. It also lists the alloy, grade, type, temper, and anneal of the various specifications along with their nominal chemical specifications. American Brass Co., Waterbury 20, Conn.

Axial Compressors

Design and construction features of compressors in sizes from 8000 to 1,000,000 cfm are presented in Bulletin 16B8863, 12 pages. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Tumbling Media

Here's a vest-pocket reference on tumbling media that describes and lists uses of aluminum oxide tumbling nuggets, grain and vitrified tumbling pellets, and rubber bonded tumbling media. Electro-Minerals Div., Carborundum Co., P. O. Box 477, Niagara Falls, N. Y.

Die Set Accessories

This 8-page bulletin lists specifications of hard steel drills, transfer screws, layout fluid, die rubber, oilers, cap screws, lock washers, hexagon nuts, spherical washers, hand knobs, and pry bars. E. W. Bliss Co., 1400 Brookpark Rd., Cleveland 9, Ohio.

Cutting Tools

Rotary cutters, countersinks, and solid carbide end mills are covered in Bulletin 701. M. A. Ford Mfg. Co., 1545 Rockingham Rd., Davenport, Iowa.

Stretchers

This 8-page bulletin describes a tensioning tool used with steel strapping in packaging. Acme Steel Co., 135th Street and Perry Avenue, Chicago 27, Ill.

Servomechanisms

Bulletin 501, 4 pages, describes a direct current servomechanism that provides a displacement output precisely related to a low voltage direct current input for control uses where rotary or linear motion is required. Advanced Research Associates Inc., 4128-B Howard Ave., Kensington, Md.

Electroplating Cobalt

This 16-page bibliography lists literature on the electroplating of cobalt and its binary and ternary alloys. Cobalt Information Center, Battelle Memorial Institute, 505 King Ave., Columbus 1, Ohio.

NEW BOOKS

Engineering Materials Handbook, Charles L. Mantell, McGraw-Hill Book Co., 327 W. 41st St., New York 36, N. Y. 1936 pages, $21.50. This reference considers materials from the viewpoint of engineering structures, machinery, and equipment. Emphasis is placed on the fabricated forms of materials, their physical and mechanical properties, advantages, limitations, and their competition with each other.

Proceedings, Metal Powder Association, 130 W. 42nd St., New York 36, N. Y. *Volume I*, $4; *Volume II*, $3.

All phases of the industry including production techniques, new machinery, and novel uses of metal powders are covered in Volume I. The special problems of ferrites and electronic cores are discussed in Volume II.

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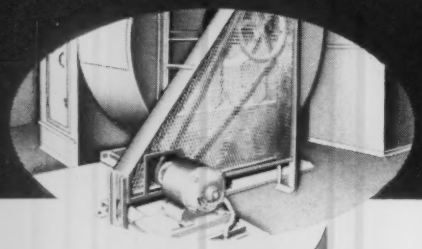

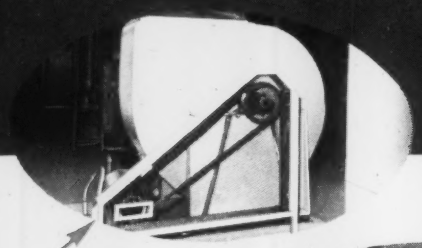

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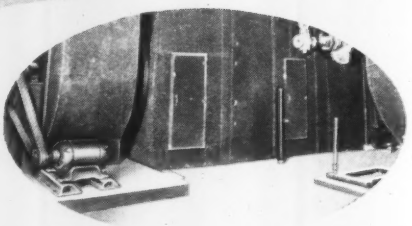

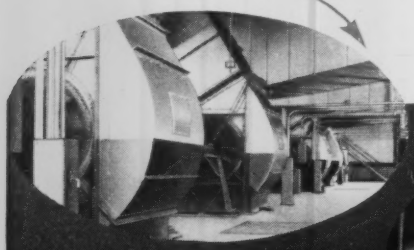

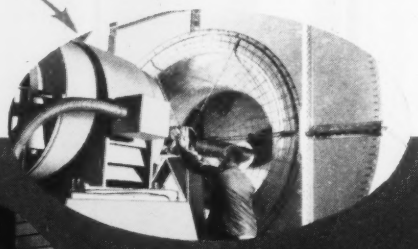

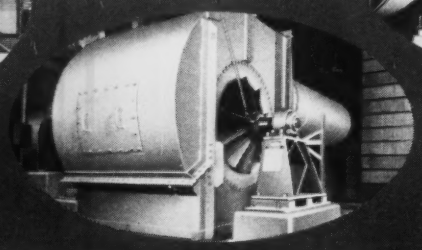

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Market Outlook

INVENTORY liquidation by steel consumers continues. But the bottom of the barrel may have been reached by some—more miscellaneous small orders are being placed, particularly for sheets.

Speaking to Cleveland purchasers, Allison R. Maxwell, president, Pittsburgh Steel Co., said: ". . . it's a safe bet that there is less inventory in plants (of users) today than there was six months or a year ago." Most steel executives agree.

SLUGGISH MARKET—While encouraged by the rise in miscellaneous buying, suppliers don't anticipate much change in market conditions over the weeks immediately ahead. The small-lot buying pickup is thought to be a reaction to stock cutting in December that was too drastic. Actually, some sellers think February volume will be down from January's.

Steelmen agree with Mr. Maxwell that: ". . . we are able to spot signs indicating the start of inventory reductions, but we are less able to know exactly when they are to run their course in any one product, or in any one industry."

LONG RANGE—Though new orders are presently limited, the long range outlook for demand is promising. Bigger military spending should generate larger orders in the months ahead. And the seasonal surge in construction will spur heavier buying of building steel products.

Expectations are that public construction, notably highways, will provide strong support for steel demand beginning in second quarter.

LOOK TO AUTOS—Hopes are still pinned on a spurt in automotive needs. But auto steel inventories have climbed to the 16-20 day level on the basis of curtailed production schedules. As a result, the industry is ordering steel largely on a day-to-day basis.

Automotive steel buyers aren't likely to resume heavy buying soon. Dealers' car stocks are around 800,000, far more than the industry desires.

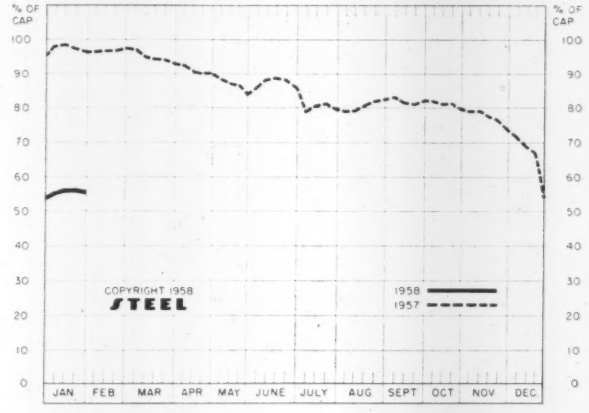
PRODUCTION SLIPS—Ingot operations continue to slump. Last week, mills turned out about 1.5 million tons, about 38,000 tons less than they did the preceding week. The rate is equal to an index figure of 93.4, based on average production in 1947-49. A year ago this index stood at 153.9.

On the basis of the Jan. 1 capacity figure (2,699,173 net tons weekly), the mills operated at about 55.5 per cent. The preceding week's rate was 56. A year ago, it was 97.5, based on a weekly capacity of 2,559,490 tons.

SCRAP STRONGER—A firmer tone has developed in scrap. It reflects broker covering on old orders rather than new consuming demand. STEEL's composite on No. 1 heavy melting last week went up 92 cents a ton. At $34.25, it is at its highest level since October.

Other price composites are unchanged. STEEL's arithmetical average on finished steel is holding at $145.42. There's more talk of a probable price boost of $5 to $6 a ton come midyear to offset a scheduled wage hike. Last week, a stainless producer reduced polishing extras on two stainless sheet finishes.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Jan. 26	Change	Same 1957	Week 1956
Pittsburgh	57.5	+ 0.5*	100	101
Chicago	58	— 4*	98.5	101.5
Mid-Atlantic	74	— 2	99	99
Youngstown	55	0	100	100
Wheeling	56.5	+ 0.5	100	98.5
Cleveland	43.5	— 2*	94	96
Buffalo	53.5	0	105	105
Birmingham	55.5	— 2.5	98	96.5
New England	52	+ 2	75	90
Cincinnati	62	0	92.5	96
St. Louis	62.5	0	98	99
Detroit	53.5	— 3*	105.5	100
Western	75	— 4	105	110
National Rate	55.5	— 0.5	97.5	99.5

INGOT PRODUCTION‡

	Week Ended Jan. 26	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	93.4†	95.7	85.0	153.9
NET TONS (In thousands)	1,500†	1,538	1,366	2,472

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

How to Make Your Shear a Production Tool

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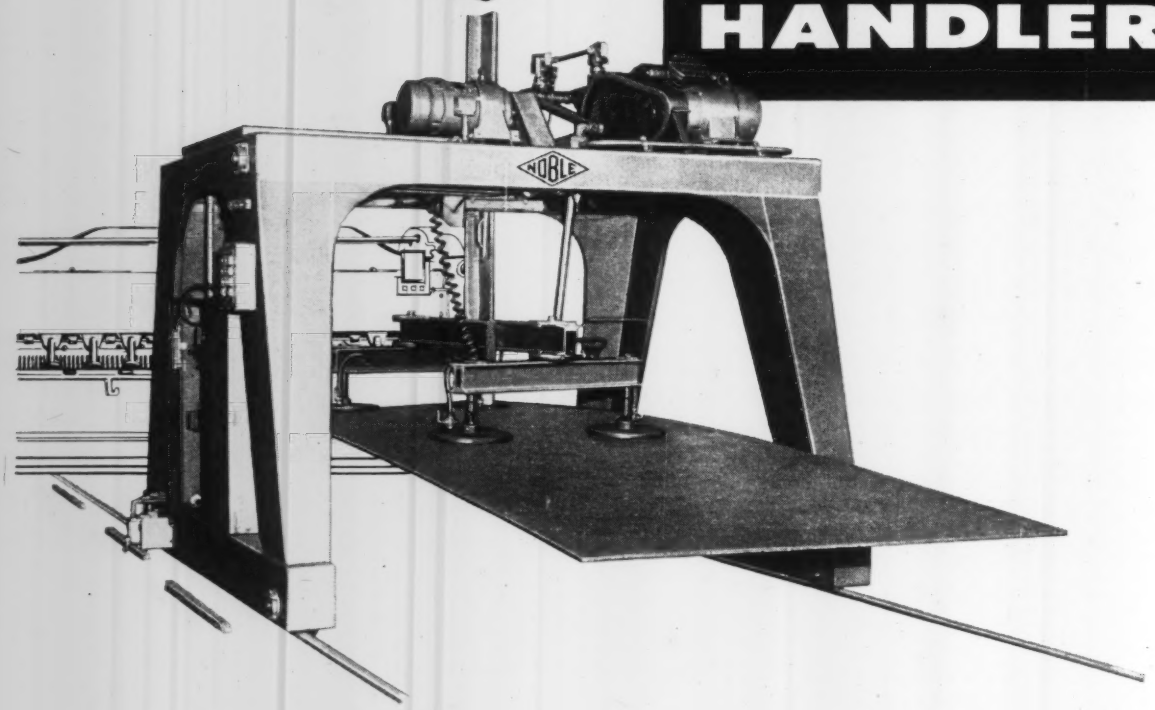

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The NOBLE Automatic Plate Handler eliminates the 3 slow, costly and often dangerous manual operations sketched at left. The usual 2- or 3-man crew needed to pry up the plate, attach lifting hooks, operate the crane or hoist and move the plate into position is eliminated. At a touch of the control button, your NOBLE Automatic travels to the stack, picks up a plate, raises it to proper height, brings it right to the ball points or casters and puts it into position for shearing, punching, or whatever operation is required. Machine operators and their helpers spend their time on production, not manhandling plate!

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With a NOBLE Automatic on the job, there's always a plate ready at the machine — no idle standby while operators help wrestle another one off the pile and onto the feed table. You get maximum earning power out of your machine investment.

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The natural result of reduced idle machine time and faster plate handling. NOBLE Automatic Plate Handler users report a gain of 20% or more, depending on type of application.

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Standard NOBLE automatic plate handling systems are available in floor-mounted rail, overhead rail and radial transfer types. Standard capacities are 1,000, 2,000, 3,000 and 4,000 lbs.

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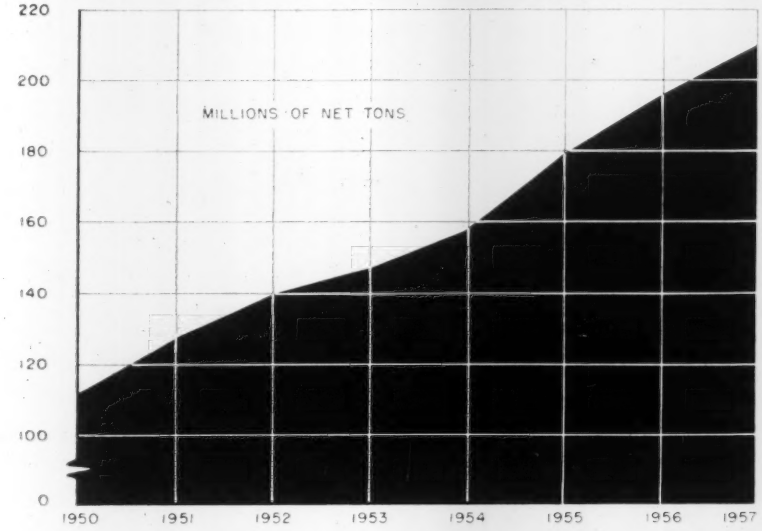
Rising Foreign Steel Output

Further Threat to Domestic Producers?



Includes Iron Curtain and Free World countries, except U. S.

PRODUCERS of merchant wire and reinforcing bars do not hesitate to answer the question posed above in the affirmative. Makers of manufacturers' wire hope the answer is no, but many are afraid that foreign-made specialty wire will ultimately be a strong competitive factor.

Producers of flat-rolled products see no cause for worry. Tariffs are high enough to discourage most overseas producers. But importers are split on one point: Some say wire imports will lead the way to higher ground for total imports. Others say tonnage this year will fall below 1957's.

Cost Cutting—Although European and U. S. demands for steel are lower than they were a year ago, many observers feel that the lure of cheaper foreign steel will result in an over-all increase in imports this year. "It's strictly a matter of price," says one southern wire manufacturer. "For several years, there have been many distributors and jobbers in our area who have held out against foreign goods. But with costs going up so high, everyone is looking for a bargain. In the last three months, many of those fellows have gone over to the cheaper foreign wire."

A substantial price break came in the European market during 1957's fourth quarter. One importer says that the price of reinforcing bars has dropped at least 20 per cent since autumn. He feels this is a temporary situation, coinciding with a dropoff in construction in Europe. When construction resumes in the spring, he says prices will rise again, making the bars less attractive to the bargain hunter.

Pattern Shifts—Here's another significant development: In the last three or four weeks, there has been a shift in the geographic distribution of imported reinforcing bars. During most of 1957, about five-sixths of the tonnage came in through Florida ports and Galveston, Tex. Since the turn of the year, significant tonnages have been arriving at New York and other eastern ports.

The greatest foreign competition still comes from such items as fencing, barbed wire, nails, and other common wire products. But there is some indication that as European steelmaking capacity grows, more of the "hard-to-make" items will enter the domestic market.

Kurt Orban, large New York importer, says: "Imports in the wire specialties are growing from year to year. European mills are capable of producing these products, but they have not grown more rapidly because they require an engineering type of sales approach rather than a purely merchant type approach." He feels that tonnage will continue to grow in these products as foreign mills and technically competent importers develop this trade.

Among the products he thinks will show growth are wire rope and rope wire, prestressed concrete wire and strand, florist wire, broom wire, and fine gage wires, such as tack, stitching, and weaving.

Penetrating — Competition is reaching farther into the hinterlands every year. Steel producers in the Pittsburgh area say foreign competition in merchant wire and bars is strong and getting stronger. It is mounting in tubes and fasteners. One midwest wiremaker says small quantities of imports are reaching the Great Lakes area, but he expects the tempo to increase as soon as the St. Lawrence Seaway opens. Another producer says that Japanese competition on the West Coast has slackened since that country has run out of dollars. He feels the lull is temporary.

Bucking the Trend — Occasionally, you hear a dissent on the import question. One New York firm, which exports and imports, says shipments of foreign wire this year will drop below the 1957 level. It feels this will reflect business conditions both here and abroad. Imports in 1958 will be between 50 and 75 per cent of the 1957 total. But if things get worse than most people now believe they will, he predicts the figure will be less than 50 per cent.

"I believe imports of wire hit the saturation point last year," says the president of another foreign trade firm: "And I think

that both domestic and foreign producers feel the same way."

Questioned about this, several U. S. producers shot back: "Don't you believe it."

Farm Buying Off—A southern producer says that some of the market for barbed wire may be dried up this year because of the soil bank program. "However, I have a feeling the domestic industry will get cut back more than foreign wire." Industry observers say that about half of all barbed wire sold in this country is made abroad.

Over the long term, few observers think that the relation of imports to domestic production will change much. Both will grow, but imports are not likely to be more than 2 or 2.5 per cent of U. S. production.

Exports Rise—Mr. Orban says that no summary of foreign trade is complete without taking into account the preponderance of exports over imports. During the first three quarters of 1957, the U. S. exported about 5.5 million tons of iron and steel products and imported 1.3 million tons. Over the year as a whole, exports increased and imports decreased.

The U. S. ships mostly heavy and flat-rolled products overseas; it imports greater tonnages of light bars and wire than of any other products. And there is no relief in sight.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 115 & 116

Large volume sheet orders (notably automotive) are still lacking, but a flurry of small-lot orders from a growing list of miscellaneous fabricators may be the first inkling that inventory reduction is beginning to bottom out.

Sales managers of Pittsburgh district mills say the rise in small orders is a reaction from overly sharp inventory shrinkage last month.

Over-all, the pickup in miscellaneous ordering is nothing to shout about. Sellers of cold-rolled sheets are expecting further declines in requirements on automotive account in February, particularly on the part of one major builder. At Pittsburgh, though, an automotive plant that cut its February tonnage under the November-January plateau volume, is thought likely to up its requirements shortly.

While sales managers generally anticipate little increase in buying of hot-rolled and galvanized sheets in the weeks immediately ahead, some sellers say demand for these products at least is holding its own. Better second quarter volume is anticipated, reflecting a seasonal upturn in construction and farm requirements.

Makers of sheet and strip specialties report slack sales. Competition is particularly severe in strip. Silicon sheet volume continues to decline.

Buffalo district suppliers say orders over the next couple weeks should provide a good clue to the course of business for the remainder of the first quarter.

Purchase of 725 tons of carbon sheets on two contracts is reported by the General Stores Depot, Navy, Philadelphia. Bethlehem Steel Co.,

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Sparrows Point, Md., booked 385 tons, and Weirton Steel Co., Weirton, W. Va., 340 tons.

Wire . . .

Wire Prices, Pages 116 & 117

Some pickup in demand for merchant wire products is expected late this quarter. Not much early change in manufacturers' wire requirements is seen, though. At Detroit, wire buying is following the general pattern of demand in the auto industry. Inventories there are reported around two weeks, and orders are being placed on a two-week delivery basis, or less. No early pickup in auto-buying is indicated.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 114

Larger order backlogs are reported by Pacific Northwest producers of reinforcing bars. They result from the placement of 8000 tons with two Seattle plants. Small tonnages add up to substantial volume, and expectations are district mills have sufficient backlogs to support operations at a fairly high level. Road construction and general building are absorbing normal tonnage for this season.

Steel Bars . . .

Bar Prices, Page 114

The bar market shows a flurry of buying interest on the part of one consumer being offset by order cancellations or shipment deferments by another.

If anything, sales of hot-rolled bars are slower, and expectations now are that February volume will be down noticeably from the order plateau that has prevailed from late November through this month.

One large Pittsburgh producer has not yet received orders from the majority of its cold-drawer customers. These interests have been placing orders for hot bars on a quick delivery basis for some time, delaying actual tonnage placements until toward the close of the month, specifying shipment the succeeding month. Orders from these converters late this month are expected to push February volume pretty close to the January level.

Makers of cold-drawn bars say their customers are demanding prompt shipments. As a result, they are unable to anticipate their hot bar requirements much in advance of the actual placing of orders.

Buying of carbon and alloy bars continues slack in New England. Hot-rolled volume from the converters there, as elsewhere, is slow, while cold-drawn deliveries are prompt on an ample range of sizes and grades. Only in defense buying is any pickup in ordering noted in the district. Recently, the Boston Navy Yard placed 105 tons of $^3/_4$-in. bars, Grade 8672.

Tubular Goods . . .

Tubular Goods Prices, Page 118

The easier market situation that developed in standard merchant pipe some months ago is spreading to other tubular goods, notably line pipe. Producers still hold sizable backlogs of unfilled orders for that item, but weakness is beginning to appear, several users having canceled, or deferred shipments, within the past couple weeks.

Oil country tubing sales continue to decline. One producer closed its mills for one week this month. This maker says unfilled orders for tubing and casing are the lowest in several years. An exception is specialty tubing, demand for which continues strong enough to support full mill operations.

Second quarter improvement in oil country goods demand is forecast. Tubemakers point out there are still over 2700 oil rigs operating in this country and Canada, and their requirements will be high.

For the most part, demand pres-

(*Please turn to Page* 110)

Shipments of Steel Products—November, 1957

(Net tons, all grades)

Products	Carbon	Alloy	Stainless	Year To Date 1957	1956
Ingots	14,083	13,351	691	438,146	657,154
Blooms, slabs, etc.	93,071	33,780	1,174	2,197,143	2,054,336
Tube rounds	596	413	.....	55,035	11,347
Skelp	5,884	.....	.....	147,591	172,718
Wire rods	77,074	1,809	377	897,178	1,026,907
Structural shapes	544,813	4,854	2	6,307,889	4,834,656
Steel piling	39,320	.....	.....	531,637	384,953
Plates	420,339	39,773	2,025	8,612,483	7,107,709
Rails (standard)	58,416	.....	.....	1,145,599	1,076,648
Rails (all other)	5,935	.....	....	83,329	92,027
Joint bars	3,576	.....	.....	77,848	75,933
Tie plates	7,362	.....	....	229,546	271,286
Track spikes	3,663	.....	.....	72,204	88,146
Wheels (Rolled-Forged)	35,415	117	.....	359,996	318,968
Axles	18,123	31	.....	196,755	155,986
Bars (hot rolled)	422,241	112,571	3,207	7,112,853	8,052,772
Bars (reinforcing)	141,977	.....	.....	2,200,524	2,277,739
Bars (cold finished)	77,184	15,197	3,240	1,235,717	1,607,767
Tool steel	840	6,216	.....	92,002	117,194
Standard pipe	179,103	14	7	2,519,574	2,681,918
Oil country goods	155,097	27,994	....	2,677,013	2,328,235
Line pipe	298,481	2	.....	3,912,672	3,045,495
Mechanical tubing	36,592	17,858	294	725,364	878,139
Pressure tubing	16,184	3,643	1,235	373,954	349,925
Wire—drawn	184,765	3,176	1,858	2,427,974	2,772,493
Nails & staples	26,158	.....	1	428,209	528,390
Barbed wire	2,081	.....	.....	57,014	71,085
Woven wire fence	7,547	.....	.....	193,556	260,234
Bale ties & baling wire	1,358	.....	.....	46,922	47,985
Black plate	43,705	.....	.....	574,690	716,774
Tin plate—HD	20,645	.....	.....	628,341	881,685
Tin plate—Electro	256,911	.....	.....	4,462,267	4,326,172
Sheets (hot rolled)	586,467	27,020	2,537	7,309,467	7,960,889
Sheets (cold rolled)	1,013,364	3,201	7,997	10,968,854	12,190,188
Sheets (galvanized)	190,380	.....	.....	2,233,282	2,718,818
Sheets (other coated)	19,365	.....	.....	190,029	211,221
Elec. sheets & strip	4,904	36,631	.....	581,945	750,074
Strip (hot rolled)	102,966	2,313	1,107	1,299,950	1,640,929
Strip (cold rolled)	95,061	1,921	17,935	1,180,475	1,442,184
Total shipments (1957)	5,211,046	351,285	43,687	74,785,027	.....
Total shipments (1956)	6,876,337	490,909	63,890	.....	76,187,079

Data from American Iron & Steel Institute.

NEW: *Man-made Giraffe*

Unique Aerial Platform Moves On Cylinders Made From Pittsburgh Tubes

Giraffes are big business at Pitman Manufacturing Company.

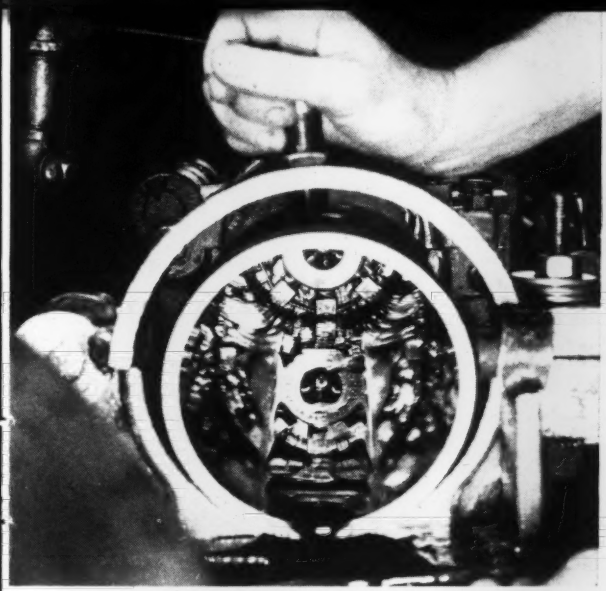
Not the giraffes of the animal kingdom but ingenious hydraulic aerial platforms. These mechanical "Giraffes" are used for anything from de-icing a giant Air Force bomber to fighting fires in tall buildings.

Pitman's truck-mounted Giraffes depend on hydraulic cylinders made exclusively of Pittsburgh Steel Company's seamless mechanical tubes. Giraffes are finding wide acceptance in varied industries because:

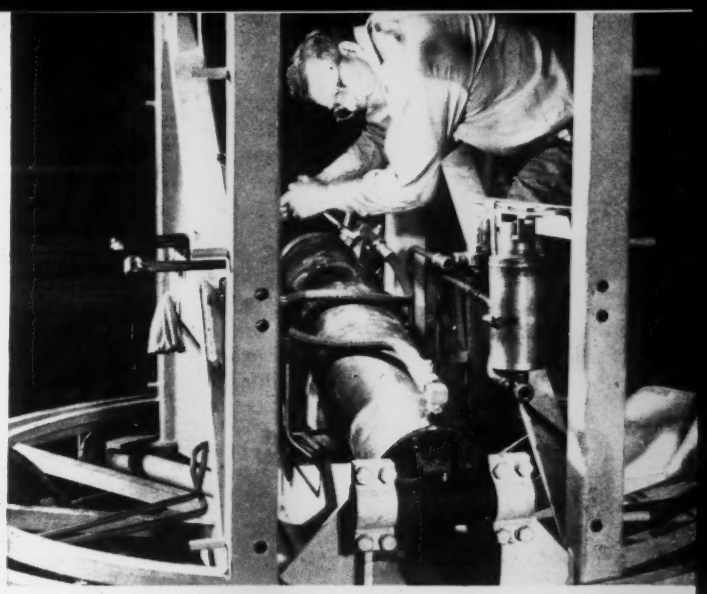
- Workmen can reach heights up to 65 feet in a fraction of the time and cost required by other methods. And their tools go up right with them.
- The roomy, insulated platform carries two men who can control all platform movements with controls duplicating those on the ground.
- The aerial platform can rotate a full 360 degrees in either direction in a radius as great as 35 feet.
- The largest of three models permits the 31-foot upper boom to move in a 160-degree vertical arc. The 23-foot lower boom can move in an 80-degree arc, so workmen can reach the exact spot they want.
- Hydraulic outriggers, operated independently, are raised or lowered by moving hand levers at side of truck.

Since hydraulic cylinders are vital to safe, dependable, economic operation of the Giraffe, Pitman makes its own cylinders with great care.

(Advertisement)



Horizontal honing of Pittsburgh Steel tubes is an exacting process. Inside the tube, you can see part of the hones. At the end of the tube, the hones are mirrored on polished steel.



Finished cylinder is installed on turntable of Pitman Giraffe. This cylinder supports and moves the lower boom. Completed Giraffe will be mounted on truck supplied by customer.

All Giraffe hydraulic cylinders are made from tubing produced by the Tube Mills of Pittsburgh Steel Company and sold by the Kansas City distributor, Metal Goods Corporation.

"We get high production from tubes because Pittsburgh tubes hold to close tolerances," declared Arthur Moore, vice president and general manager of Pitman Manufacturing. He added:

"We give Pittsburgh Steel tubes credit for cutting our scrap losses. But economy isn't all we're thinking of. Since we never forget that men's lives depend on our cylinders we build a safety factor of at least three into every cylinder. We've never had a burst cylinder or a cylinder wall failure with Pittsburgh tubes.

"Finally, Pittsburgh Steel gives us the kind of service we like."

Mr. Moore said engineers from Pittsburgh Steel helped analyze the company's tube problems, suggested some design changes and took Pitman's prints back to the mill to make tubing which exactly fills the bill.

"The service which Pittsburgh Steel instituted ended our tubing problems," said Mr. Moore. "Our cylinders have been very satisfactory ever since."

Whether you make hydraulic cylinders or use seamless mechanical tubing in another application needing uniformity, close tolerances and engineering help, you can profit by Pitman's experience.

Start today by getting in touch with trained help available through any Pittsburgh Steel Company District Office or from one of the Pittsburgh Steel distributors listed at right.

Fire-fighting is just one of many uses for the Pitman Giraffe. These firefighters can move their platform to any given spot quickly and easily without losing time when time counts most.

Pittsburgh Seamless Distributors

Baker Steel & Tube Company
Los Angeles, California

Chicago Tube & Iron Company
Chicago, Illinois

Cleveland Tool & Supply Co.
Cleveland, Ohio

Drummond McCall & Co., Ltd.
Montreal, Quebec, Canada

Edgcomb Steel Company
Philadelphia, Pennsylvania

Gilmore Steel & Supply Co.
San Francisco, California

Earle M. Jorgensen Co.

Perry Kilsby, Inc.
Los Angeles, California

Mapes & Sprowl Steel Co.
Union, New Jersey

Metal Goods Corporation
St. Louis, Missouri

Miller Steel Company, Inc.
Hillside, New Jersey

A. B. Murray Co., Inc.
Elizabeth, New Jersey

C. A. Russell, Inc.
Houston, Texas

Ryerson, Joseph T. & Son, Inc.
Chicago, Illinois

Solar Steel Corporation
Cleveland, Ohio

Steel Sales Corporation
Chicago, Illinois

Tubular Sales
Detroit, Michigan

Ward Steel Service Company
Dayton, Ohio

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta, Chicago, Cleveland, Dallas, Dayton, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, Tulsa, Warren, Ohio

(Advertisement)

(*Concluded from Page* 107)

sure is off the pipe mills. This is reflected in a sharp curtailment of operations at most producing points.

Bids have been entered on more than 1300 tons of cast iron pipe required by Portland, Oreg., and Seattle. Awards are expected shortly. New projects are developing in the Pacific Northwest which encourage district cast pipe sales agencies to anticipate normal business volume in the 1958 contracting season.

Semi-finished Steel . . .

Semifinished Prices, Page 114

Further cutbacks in steelmaking operations were reported by several producers over the past week. Colorado Fuel & Iron Corp. curtailed operations at its Pueblo, Colo., Works to "keep inventories in balance and reduce costs."

Departments that reduced operations: Open hearth, from ten to eight furnaces; rail mill cutting, from 15 to 10 turns; 25-in. mill, from eight to five turns; 14-in. mill, from 15 to 10 turns; rod mill, from 20 to 8 turns; seamless tube mill, from 20 to 15 turns.

Bethlehem Steel's Lackawanna (N. Y.) plant produced 5,369,507 net tons of ingots in 1957, exceeding the previous high of 5,258,335 tons, set in 1955, by 111,172.

The plant's payroll was a record $110,159,000, up $13,024,000 from the 1956 total. Average employment was 19,300, a gain of 135 over the 19,165 reported for 1956.

Iron ore receipts at the plant reached 6,030,000 net tons, compared with 5,425,000 the preceding year. Of the total tonnage, 8.3 per cent was pellets from the company's mine at Marmora, Canada, and 2.2 per cent, pellets from the Erie Mining Co.'s taconite plant at Aurora, Minn.

Steel Shipments By Market Outlets—November, 1957

(Net tons, all grades)

Markets	1957 November	1956 November	Shipments in First 11 Months 1957	% of Total Shipments	1956	% of Total Shipments
Converting and Processing	50,583	343,261	3,154,344	4.5	3,624,703	5.0
Forgings (other than automotive)	70,184	120,780	993,066	1.4	1,355,295	1.9
Bolts, rivets, etc.	98,524	141,479	1,066,472	1.5	1,351,001	1.8
Warehouses:						
Oil and Gas	141,869	206,193	2,219,111	3.1	2,035,419	2.8
All other	778,014	1,274,664	11,535,929	16.4	13,298,778	18.2
Total Warehouse	919,883	1,480,857	13,755,040	19.5	15,334,197	21.0
Construction:						
Railroad	5,460	4,259	65,683	0.1	61,921	0.1
Oil and Gas	245,799	249,765	3,229,435	4.6	2,294,698	3.1
All other	693,818	753,907	8,338,727	11.8	7,061,109	9.7
Total Construction	945,077	1,007,931	11,633,845	16.5	9,417,728	12.9
Contractors Products	239,149	345,260	3,192,651	4.5	3,778,769	5.2
Automotive:						
Cars, etc.	1,290,313	1,345,743	12,824,320	18.2	12,355,940	16.9
Forgings	29,713	31,368	311,031	0.4	363,753	0.5
Total Automotive	1,320,026	1,377,111	13,135,351	18.6	12,719,693	17.4
Rail Transport:						
Rails, etc.	60,245	121,546	1,356,583	1.9	1,451,627	2.0
Cars, etc.	190,854	253,103	2,551,271	3.6	2,368,120	3.3
Street Railways	3,134	2,176	36,276	0.1	27,964	
Total Transport	254,233	376,825	3,944,130	5.6	3,847,711	5.3
Shipbuilding	118,980	80,918	1,174,511	1.7	684,137	0.9
Aircraft	4,505	12,150	95,343	0.1	122,318	0.2
Oil, Gas Drilling	37,394	62,991	664,062	0.9	717,359	1.0
Mining, etc.	19,581	31,047	309,747	0.4	324,162	0.4
Agricultural:						
Machinery	87,997	68,237	831,353	1.2	740,264	1.0
All other	9,704	13,664	173,139	0.2	248,982	0.3
Total Agricultural	97,701	81,901	1,004,492	1.4	989,246	1.3
Machinery, etc.	297,477	446,038	4,245,130	6.0	4,594,816	6.3
Elec. Machinery	152,730	216,988	1,955,593	2.8	2,244,718	3.1
Appliances, etc.	136,317	170,025	1,441,773	2.1	1,982,527	2.7
Other equipment	135,484	188,133	1,723,675	2.5	2,106,417	2.9
Containers:						
Cans and closures	265,626	330,442	4,615,009	6.5	4,771,698	6.5
Barrels, etc.	47,791	96,226	772,381	1.1	942,904	1.3
All other	35,851	58,928	553,904	0.8	715,642	1.0
Total Containers	349,268	485,596	5,941,294	8.4	6,430,244	8.8
Ordnance, etc.	15,923	49,916	333,989	0.5	486,111	0.7
Nonreported	54,055	78,829	770,086	1.1	877,962	1.2
Total domestic	5,317,074	7,098,036	70,534,594	100.0	72,989,114	100.0
Exports	288,944	333,100	4,250,433	....	3,197,965	....
Total Shipments	5,606,018	7,431,136	74,785,027	....	76,187,079	....

Data from the American Iron & Steel Institute.

Plates . . .

Plate Prices, Page 114

Although some plate producers are booked up through February on the heavier and wider gages, some spot tonnages can be worked into rolling schedules for next month. This reflects the easier situation that has developed in the market since the closing weeks of last year.

Eastern plate shops are operating at a lower rate with their order backlogs smaller. Forward buying on a quarterly basis has virtually halted, notably in light gage and universal carbon grade plates. Most fabricators are buying against actual contract requirements only. This accounts for slower filling up of first quarter producing capacity.

The shipyards have received some cancellations on tanker contracts, it is reported, and keel-laying schedules on other vessels are being stretched out. The estimated tonnage required for tankers placed since the Suez Canal crisis is being revised downward, both on U. S. and foreign account. Definite cancellations include three 47,000-ton tankers at a Pennsylvania shipyard.

In New England, storage tank inquiry for government installations is slightly heavier, including tonnage for Newport, R. I., Bangor, Maine, and Burlington, Vt.

With industrial construction off sharply, plate requirements in that area of the market have declined. A further drop in plate orders is expected by Pittsburgh mills to result from setbacks in line pipe orders. Railroad needs also are slipping.

Reflecting the slackened demand, plate supplies in practically all sizes are readily available. Mills close to Pittsburgh are actively seeking business, and fabricators in that area are cutting their stocks.

While no large plate jobs are up for figures currently in the Pacific Northwest, it is reported a sub-

challenging careers for young women

Cyto-technologists... specialists in the study of human body cells... are in growing demand in many communities today. More and more of them will be needed, as more women learn of the life-saving role of the cell examination, through the American Cancer Society's expanding program to conquer uterine cancer... second greatest cancer killer among women.

Trained for six months, the cyto-technologist is ready for her responsible duties. She is the good right hand of the pathologist. To her trained eye, the microscope reveals the very secrets of life. Her alertness in classifying slides can mean the difference between life and death to women.

In this life-saving project, men and women work together as do nurse and doctor, x-ray technician and radiologist, and other great teams in medicine. Security, pleasant colleagues and the satisfaction of being part of an all-out attack on the most dreaded of diseases ... these are some of the satisfactions in this rewarding profession.

Chemistry or biology students who have completed two years of college (or the equivalent) are eligible for fellowships, which cover tuition and basic living costs during training.

For further information write to the Division of the American Cancer Society in your state.

AMERICAN CANCER SOCIETY

stantial tonnage has been placed for tanks and equipment for a pulp plant in Alaska.

Supply and demand for plates have been in reasonable balance since December. The pinch was not expected to ease until the middle of the first quarter, but an unfavorable court ruling on proposed rate increases prompted the natural gas industry to freeze its pipeline expansion plans. It's estimated that orders for 500,000 to 600,000 tons of line pipe are being deferred—enough to reduce steel production about 5 per cent.

Stainless Steel . . .

Stainless Steel Prices, Page 118

Polishing extras on two stainless steel sheet finishes were reduced last week by Eastern Stainless Steel Corp., Baltimore. The new schedule reflects reduced prices for one-side polishing extras on No. 100 grit and No. 4 polished stainless sheets up to and including 48-in. width.

Richard C. Cunningham, vice president-sales, said the company was passing along to customers economies resulting from production on its new Sendzimir cold-reduction mill of stainless sheet which can be given either the 100 grit or No. 4 finish economically.

Eastern's new schedule reflects polishing-charge reductions ranging from 25 cents per 100 lb for No. 8 gage (from $6.75 to $6.50), to $13.50 per 100 lb for No. 28 gage (from $25.50 to $12) in 100 grit finish; for No. 4 polished finish, from 25 cents per 100 lb for No. 9 gage (from $8.25 to $8), to $11.25 per 100 lb for No. 28 gage (from $33.25 to $22).

Average reductions are about $2.50 per 100 lb for 100 grit and about $4 for No. 4 finish.

Stainless steel shipments to the auto industry are down. The outlook isn't bright, although a Detroit area producer says its eastern markets show improvement: some orders, largely to bolster inventories, are trickling in. This mill says activity in the first two weeks of January was greater than it was in December.

Imported Steel delivered on Domestic Terms

No red tape! We deliver to any place in North America. Over 10 years of service to more than 2000 North American accounts—as a domestic firm, on domestic terms—with lower costs or better deliveries. Write for "How to be at home with products made abroad" and the address of your local Kurt Orban Company representative.

Prices per 100 lbs. (except where otherwise noted) landed, including customs duty, but no other taxes.

	Atlantic & Gulf Coast	West Coast	Vancouver	Montreal
Deformed Bars (⅜" Dia. incl. all extras)	$5.93	$6.18	$6.12	$5.76
Merchant Bars (¼" Round incl. all extras) ...	7.05	7.29	6.65	6.28
Bands (1"x¼"x20' incl. all extras)	7.76	7.98	7.65	7.38
Angles (2"x2"x¼" incl. all extras)	5.98	6.23	6.46	6.10
Beams & Channels (base)	6.43	6.66	6.92	6.56
Furring Channels (C.R. ¾", per 1000')	26.67	27.36	....	....
Barbed Wire (per 82 lb. net reel)	6.95	7.40	7.75	7.80
Nails (bright, common, 20d and heavier)	8.12	8.32	8.97	8.79
Larssen Sheet Piling (section II, new, incl. size extra)	7.80	8.10	8.10	7.80
Wire, Manufacturer's bright, low C, (11½ ga.)	7.15	7.29	8.29	8.29
Wire, galv., Fence qual., low C, (11½ ga.) ..	7.68	7.82	9.09	9.09
Wire, Merchant quality, bl. ann., (10 ga.) ...	7.27	7.42	8.45	8.45
Rope Wire (.045", 247,000 PSI, incl. extras)..	13.60	13.75	13.00	13.00
Wire, fine and weaving, low C, (20 ga.)	10.66	10.80	10.17	12.17
Tie Wire, autom. baler (14½ ASWG, 97 lbs. net)	9.58	9.73	9.64	9.54
Merchant Pipe (½" galv. T & C, per 100') ...	8.48	8.83	....	....
Casing (5½", 15.5 J55, T & C, per 100')	189.00	194.00	....	....
Tubing (2⅞", 6.4 J55, EUE, per 100')	98.00	99.00	....	....
Forged R Turn. Bars, C-1035 (from 10" dl.)	13.50	13.73	13.50	13.24

Ask prices on: Bulb tees, bolts and nuts, manganese steel plates and shapes, welded wire reinforcing mesh and hardware cloth, boiler tubes, A-335-P11 pressure pipe.

from prominent century-old West German Mills

Through Stahlunion-Export GmbH

BOCHUMER VEREIN World's first Steel Foundry, 1842—Vacuum degassed Forgings, Pinion wire and spring wire for watches and clocks.
DORTMUNDER UNION Originators of Interlock Sheet Piling—Larssen Sheet Piling, Plate, Shapes, Forged Bars and Shafts.
NIEDERRHEIN Europe's most modern Rod Mill—OH, CH. Low Metalloid, Specialty Wire Rod, Merchant Bars.
WESTFAELISCHE UNION Europe's largest Wire Mill—All types drawn Wire and Wire Products—Nails, Barbwire, Wire Rope, Prestress Concrete Wire and Strand.
PHOENIX RHEINROHR Europe's largest Pipe Mill—Pipe, Tubing, Flanges, Welding Fittings, Precision Tubes, Tubular Masts.

Ask us to quote on your requirements

KURT ORBAN COMPANY, INC., 46 Exchange Place, Jersey City 2, N. J.
In Canada: Kurt Orban Canada, Ltd., Vancouver, Toronto, Montreal

Structural Shapes . . .

Structural Shape Prices, Page 114

Suppliers of structurals can fill all orders for wide flange beams within normal leadtime. Customers report it is increasingly easy to order all the tonnage they require for quick delivery.

As a result of the slackened demand over recent weeks, competition for fabricated structural steel contracts has intensified. The number of shops estimating tonnage in the East has doubled.

Prices of steel in place are lower, and a noticeable dislocation among suppliers is developing. In New England, for instance, more eastern Pennsylvania and New York fabricating shops are estimating jobs. In some cases, they are successful on price and delivery factors, including plate girder volume. Some shops are striving to maintain the price structure, but, generally, they hold higher than average backlogs, notably bridges, and are in position to resist downward pressures.

Smaller shops in the Philadelphia-Baltimore area are using prices and earlier shipment promises to attract new orders. They are aided by substantial stocks and improved mill deliveries. They can also obtain fill-in tonnage from warehouses.

Prospects are that demand for structural shapes will remain slow until the seasonal upturn in building this spring. Suppliers of fabricated structurals expect 1958 volume to be off from last year's in some categories of private construction, notably industrial building. But they anticipate a 10 to 15 per cent increase in shape consumption from highway work.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

430 tons, high school, Camp Hill, Pa., to Dauphin Steel & Engineering Co. Inc., Harrisburg, Pa.; H. B. Alexander & Son, Harrisburg, general contractor; 105 tons, steel bar joists, Truscon Steel Div., Republic Steel Corp., Philadelphia.

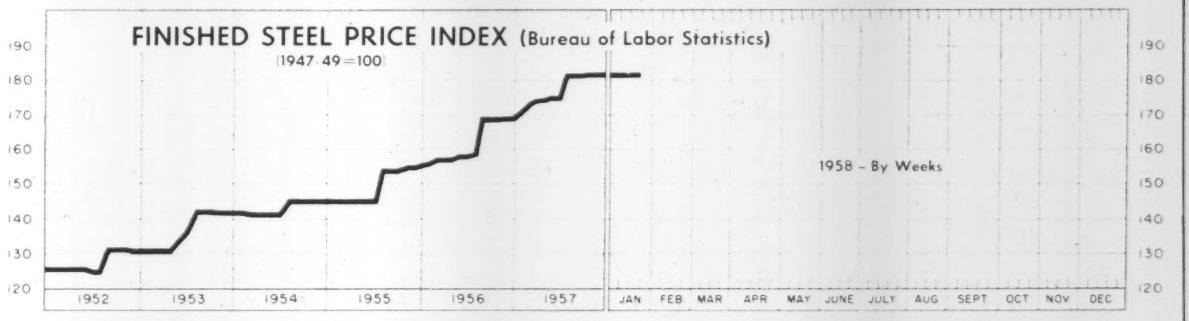
350 tons, Washington state bridge, Snohomish County, to Poole, McGonigle & Dick, Portland, Oreg.; Anderson Bridge Co. Tacoma, Wash., general contractor.

250 tons, structurals and bars, warehouse, B. F. Goodrich Co., Shelton, Conn., to Topper & Griggs (Bethlehem Fabricators Inc.) Hartford, Conn., and U. S. Steel Supply Div., U. S. Steel Corp., Hartford (bars); W. J. Megin Inc., Naugatuck, Conn., general contractor.

250 tons, state highway trestle structure, Manahawkin Bay, Stafford-Ship Bottom, N. J., to Irvington Iron & Steel Co., New Bruns-

(*Please turn to Page* 124)

Price Indexes and Composites



Jan. 21, 1958	Week Ago	Month Ago	Dec. Avg.	Year Ago
181.7	181.7	181.7	181.7	171.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 21

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.210
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.220
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.245
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Jan. 22 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	225.92	181.31
Index in cents per lb	6.479	6.479	6.479	6.111	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$137.98	$110.98
No. 2 Fdry Pig Iron, GT.	66.49	66.49	66.49	62.63	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	62.18	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	63.41	55.77
Steelmaking Scrap, GT	34.25	33.33	33.17	59.17	43.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Jan. 22 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld., Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.75-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.10-5.225
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.20	6.20-6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, 7/32-9/16" Pitts.	6.15	6.15	6.15	5.80	4.425

PIG IRON, Gross Ton	Jan. 22 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$63.50	$55.50
Basic, Valley	66.00	66.00	66.00	62.50	54.50
Basic, deld., Philad.	70.01	70.01	70.01	66.26	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	63.00	55.00
No. 2 Fdry, deld., Phila.	70.51	70.51	70.51	66.78	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	63.00	55.00
Malleable, Chicago	66.50	66.50	66.50	63.00	55.00
Ferromanganese, Duquesne	245.00†	245.00†	245.00†	235.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$32.50	$32.50	$31.50	$61.50	$44.00
No. 1 Heavy Melt, E. Pa.	37.75	37.00	37.00	59.00	41.50
No. 1 Heavy Melt, Chicago	32.50	30.50	31.00	57.00	42.50
No. 1 Heavy Melt, Valley	30.50	30.50	29.50	63.50	44.00
No. 1 Heavy Melt, Cleve.	27.50	27.50	26.50	60.50	43.00
No. 1 Heavy Melt, Buffalo	28.50	28.50	30.50	61.50	43.00
Rails, Rerolling Chiago	50.50	49.50	49.50	72.50	52.50
No. 1 Cast, Chicago	39.50	39.50	38.50	48.50	43.00

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$15.00	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.00	17.00

Steel Prices

Mill prices as reported to STEEL, Jan. 22, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 115; to footnotes, page 117.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 .....$77.00
Farrell,Pa. S3 .....77.00
Lowellville,O. S3 .....77.00
Midland,Pa. C18 .....77.00
Munhall,Pa. U5 .....77.00
Sharon,Pa. S3 .....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 .....77.50
Clairton,Pa. U5 .....77.50
Ensley,Ala. T2 .....77.50
Fairfield,Ala. T2 .....77.50
Fontana,Calif. K1 .....88.00
Gary,Ind. U5 .....77.50
Johnstown,Pa. B3 .....77.50
Lackawanna,N.Y. B2 ..77.50
Munhall,Pa. U5 .....77.50
S.Chicago,Ill. R2, U5 ..77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 .....77.50
Youngstown R2 .....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2 .....98.50
Clairton,Pa. U5 .....96.00
Conshohocken,Pa. A3 .101.00
Ensley,Ala. T2 .....96.00
Fairfield,Ala. T2 .....96.00
Fontana,Calif. K1 .....105.50
Gary,Ind. U5 .....96.00
Geneva,Utah C11 .....96.00
Houston S5 .....101.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....105.50
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
Seattle B3 .....109.50
Sharon,Pa. S3 .....96.00
S.Chicago R2, U5, W14 96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 .....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$114.00
Bridgeport,Conn. C32 .114.00
Buffalo R2 .....114.00
Canton,O. R2, T7 .....114.00
Conshohocken,Pa. A3 .121.00
Detroit S41 .....114.00
Economy,Pa. B14 .....114.00
Farrell,Pa. S3 .....114.00
Fontana,Calif. K1 .....135.00
Gary,Ind. U5 .....114.00
Houston S5 .....119.00
Ind.Harbor,Ind. Y1 .....114.00
Johnstown,Pa. B2 .....114.00
Lackawanna,N.Y. B2 ..114.00
Los Angeles B3 .....134.00
Lowellville,O. S3 .....114.00
Massillon,O. R2 .....114.00
Midland,Pa. C18 .....114.00
Munhall,Pa. U5 .....114.00
Sharon,Pa. S3 .....114.00
S.Chicago R2,U5,W14 .114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 .....114.00
Warren,O. C17 .....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 .....$117.50
Canton,O. R2 .....120.00
Cleveland R2 .....117.50
Gary,Ind. U5 .....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ....117.50
Warren,O. C17 .....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 .....4.875
Warren,O. R2 .....4.875
Youngstown R2, U5 ..4.875

WIRE RODS
AlabamaCity,Ala. R2 ..6.15
Aliquippa,Pa. J5 .....6.15
Alton,Ill. L1 .....6.35
Buffalo W12 .....6.15
Cleveland A7 .....6.15
Donora,Pa. A7 .....6.15
Fairfield,Ala. T2 .....6.15
Houston S5 .....6.40
IndianaHarbor,Ind. Y1 ..6.15
Johnstown,Pa. B2 .....6.15
Joliet,Ill. A7 .....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 .....6.25
LosAngeles B3 .....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 .....6.15
N.Tonawanda,N.Y. B11 6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 .....6.15
Roebling,N.J. R5 .....6.25
S.Chicago,Ill. R2 .....6.15
SparrowsPoint,Md. B2 ..6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 .....6.25
Struthers,O. Y1 .....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
Ala.City,Ala. R2 ....5.275
Atlanta A11 .....5.475
Aliquippa,Pa. J5 .....5.275
Bessemer,Ala. T2 .....5.275
Bethlehem,Pa. B2 .....5.325
Birmingham C15 .....5.275
Clairton,Pa. U5 .....5.275
Fairfield,Ala. T2 .....5.275
Fontana,Calif. K1 .....6.075
Gary,Ind. U5 .....5.275
Geneva,Utah C11 .....5.275
Houston S5 .....5.375
Ind.Harbor,Ind. I-2 .....5.275
Johnstown,Pa. B2 .....5.325
Joliet,Ill. P22 .....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 .....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 .....5.275
Niles,Calif. P1 .....5.925
Phoenixville,Pa. P4 ....5.325
Portland,Oreg. O4 .....6.025
Seattle B3 .....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 .....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 .....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 .....5.275
Fontana,Calif. K1 .....6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
Phoenixville,Pa. P4 ....5.325
S.Chicago,Ill. U5 .....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.65
KansasCity,Mo. S5 .....6.65
Munhall,Pa. U5 .....6.55
S.Chicago,Ill. U5 .....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 .....7.75
Bessemer,Ala. T2 .....7.75
Bethlehem,Pa. B2 .....7.80
Clairton,Pa. U5 .....7.75
Fairfield,Ala. T2 .....7.75
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.75
Geneva,Utah C11 .....7.75
Houston S5 .....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 .....7.80
KansasCity,Mo. S5 .....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 .....8.45
Munhall,Pa. U5 .....7.75
Seattle B3 .....8.50
S.Chicago,Ill. U5, W14 .7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 .....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 .....7.75
S.Chicago,Ill. U5 .....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 .....5.275
S.Chicago,Ill. U5 .....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 .....6.225
S.Chicago,Ill. U5 .....6.225
Weirton,W.Va. W6 .....6.225

PLATES

PLATES, Carbon Steel
Ala.City,Ala. R2 .....5.10
Aliquippa,Pa. J5 .....5.10
Ashland,Ky. (15) A10 ..5.10
Bessemer,Ala. T2 .....5.10
Clairton,Pa. U5 .....5.10
Claymont,Del. C22 .....5.10
Cleveland J5, R2 .....5.20
Coatesville,Pa. L7 .....5.10
Conshohocken,Pa. A3 ..5.20
Ecorse,Mich. G5 .....5.20
Fairfield,Ala. T2 .....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 .....5.10
Geneva,Utah C11 .....5.10
GraniteCity,Ill. G4 .....5.30
Harrisburg,Pa. P4 .....5.10
Houston S5 .....5.20
Ind.Harbor,Ind. I-2, Y1 .5.10
Johnstown,Pa. B2 .....5.10
Lackawanna,N.Y. B2 ..5.10
LoneStar,Tex. L6 .....5.45
Mansfield,O. E6 .....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 .....5.10
Newport,Ky. A2 .....5.10
Pittsburgh J5 .....5.10
Riverdale,Ill. A1 .....5.10
Seattle B3 .....6.00
Sharon,Pa. S3 .....5.10
S.Chicago,Ill. U5, W14 .5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 .....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 .....5.10
Youngstown U5, Y1 .....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .....6.75
Fontana,Calif. K1 .....7.55
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Johnstown,Pa. B2 .....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 .....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 .....7.625
Bessemer,Ala. T2 .....7.625
Clairton,Pa. U5 .....7.625
Claymont,Del. C22 .....7.625
Cleveland J5, R2 .....7.625
Coatesville,Pa. L7 .....7.925
Conshohocken,Pa. A3 ..7.625
Economy,Pa. B14 .....7.625
Ecorse,Mich. G5 .....7.725
Fairfield,Ala. T2 .....7.625
Farrell,Pa. S3 .....7.625
Fontana,Calif.(30) K1 .8.425
Gary,Ind. U5 .....7.625
Geneva,Utah C11 .....7.625
Houston S5 .....7.725
Ind.Harbor,Ind. I-2, Y1 7.625
Johnstown,Pa. B2 .....7.625
Munhall,Pa. U5 .....7.625
Pittsburgh J5 .....7.625
Seattle B3 .....8.525
Sharon,Pa. S3 .....7.625
S.Chicago,Ill. U5, W14 .7.625
SparrowsPoint,Md. B2 ..7.625
Warren,O. R2 .....7.625
Youngstown U5 .....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 .....7.20
Claymont,Del. C22 .....7.20
Coatesville,Pa. L7 .....7.20
Economy,Pa. B14 .....7.20
Farrell,Pa. S3 .....7.20
Fontana,Calif.(30) K1 ..8.00
Gary,Ind. U5 .....7.20
Houston S5 .....7.30
Ind.Harbor,Ind. Y1 .....7.20
Johnstown,Pa. B2 .....7.20
Lowellville,O. S3 .....7.20
Munhall,Pa. U5 .....7.20
Newport,Ky. A2 .....7.20
Pittsburgh J5 .....7.20
Seattle B3 .....8.10
Sharon,Pa. S3 .....7.20
S.Chicago,Ill. U5, W14 .7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 .....7.20

FLOOR PLATES
Cleveland J5 .....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor,Ind. I-2 ....6.175
Munhall,Pa. U5 .....6.175
S.Chicago,Ill. U5 .....6.175

PLATES, Ingot Iron
Ashland c.l. (15) A10 ..5.35
Ashland l.c.l. (15) A10 .5.85
Cleveland c.l. R2 .....5.85
Warren,O. c.l. R2 .....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ....5.425
Aliquippa,Pa.(9) J5 ....5.425
Alton,Ill. L1 .....5.625
Atlanta(9) A11 .....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ..5.425
Buffalo(9) R2 .....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland(9) R2 .....5.425
Ecorse,Mich.(9) G5 ....5.525
Emeryville,Calif. J7 ....6.175
Fairfield,Ala.(9) T2 ....5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ..6.125
Gary,Ind.(9) U5 .....5.425
Houston(9) S5 .....5.675
Ind.Harbor(9) I-2, Y1 ..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ....5.875
Niles,Calif. P1 .....6.125
N.T'wanda,N.Y.(23)B11 5.775
Pittsburg,Calif.(9) C11 .6.125
Pittsburgh(9) J5 .....5.425
Portland,Oreg. O4 .....6.175
Seattle B3, N14 .....6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 ..5.425
S.SanFran.,Calif.(9)B3 .6.175
Sterling,Ill.(1)(9) N15 ..5.425
Sterling,Ill.(9) N15 ....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 .6.125
Youngstown(9) R2, U5 .5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 .....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.475
Bethlehem,Pa. B2 .....6.475
Bridgeport,Conn. C32 ....6.55
Buffalo R2 .....6.475
Canton,O. R2, T7 .....6.475
Clairton,Pa. U5 .....6.475
Detroit S41 .....6.475
Economy,Pa. B14 .....6.475
Ecorse,Mich. G5 .....6.575
Fairless,Pa. U5 .....6.625
Farrell,Pa. S3 .....6.475
Fontana,Calif. K1 .....7.525
Gary,Ind. U5 .....6.475
Houston S5 .....6.725
Ind.Harbor,Ind. I-2, Y1 .6.475
Johnstown,Pa. B2 .....6.475
KansasCity,Mo. S5 .....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 .....6.475
LosAngeles B3 .....7.525
Massillon,O. R2 .....6.475
Midland,Pa. C18 .....6.475
Pittsburgh J5 .....6.475
Sharon,Pa. S3 .....6.475
S.Chicago R2, U5, W14 .6.475
S.Duquesne,Pa. U5 .....6.475
Struthers,O. Y1 .....6.475
Warren,O. C17 .....6.475
Youngstown U5 .....6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 .....7.925
Bessemer,Ala. T2 .....7.925
Bethlehem,Pa. B2 .....7.925
Clairton,Pa. U5 .....7.925
Cleveland R2 .....7.925
Ecorse,Mich. G5 .....8.025
Fairfield,Ala. T2 .....7.925
Fontana,Calif. K1 .....8.625
Gary,Ind. U5 .....7.925
Houston S5 .....8.175
Ind.Harbor,Ind. Y1 .....7.925
Johnstown,Pa. B2 .....7.925
KansasCity,Mo. S5 .....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 .....8.625
Pittsburgh J5 .....7.925
Seattle B3 .....8.675
S.Chicago,Ill. U5, W14 .7.925
S.Duquesne,Pa. U5 .....7.925
S.SanFrancisco B3 .....8.675
Struthers,O. Y1 .....7.925
Youngstown U5 .....7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 .....5.675
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 .....5.525
Sterling,Ill.(1)(9) N15 ..5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 .....5.425
Atlanta A11 .....5.625
Joliet,Ill. P22 .....5.425
Niles,Calif. P1 .....6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 .....6.175
SanFrancisco S7 .....6.275
Seattle B3 .....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 .....6.55
Clairton,Pa. U5 .....6.55
Gary,Ind. U5 .....6.55
Houston S5 .....6.80
KansasCity,Mo. S5 .....6.80
Pittsburgh J5 .....6.55
Youngstown U5 .....6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 .....10.10
Chicago W18 .....9.925
Cleveland C20 .....9.925
Elyria,O. W8 .....9.925
LosAngeles S30
(Grade A) 11.30
(Grade B) 11.80
LosAngeles P2
(Grade A) 11.40
(Grade B) 11.90
Monaca,Pa. S17 .....9.925
Newark,N.J. W18 .....10.10
SpringCity,Pa. K3 .....10.10
Warren,O. C17 .....9.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....7.30
BeaverFalls,Pa. M12,R2 .7.30
Birmingham C15 .....7.60
Bridgeport,Conn. C32 ..7.65
Buffalo B5 .....7.35
Camden,N.J. P13 .....7.75
Carnegie,Pa. C12 .....7.30
Chicago W18 .....7.30
Cleveland A7, C20 .....7.30
Detroit B5, P17 .....7.50
Detroit S41 .....7.30
Donora,Pa. A7 .....7.30
Elyria,O. W8 .....7.30
FranklinPark,Ill. N5 .....7.30
Gary,Ind. R2 .....7.30
GreenBay,Wis. F7 .....7.30
Hammond,Ind. J5, L2 ..7.30
Hartford,Conn. R2 .....7.80
Harvey,Ill. B5 .....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2, R2 .....8.75
Mansfield,Mass. B5 .....7.85
Massillon,O. R2, R8 .....7.30
Midland,Pa. C18 .....7.30
Monaca,Pa. S17 .....7.30
Newark,N.J. W18 .....7.75
NewCastle,Pa.(17) B4 ..7.30
Pittsburgh J5 .....7.30
Plymouth,Mich. P5 .....7.55
Putnam,Conn. W18 .....7.85
Readville,Mass. C14 .....7.85
S.Chicago,Ill. W14 .....7.30
SpringCity,Pa. K3 .....7.75
Struthers,O. Y1 .....7.30
Warren,O. C17 .....7.30
Willimantic,Conn. J5 ....7.80
Waukegan,Ill. A7 .....7.30
Youngstown F3, Y1 .....7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 ..6.55

BARS, Cold Finished Alloy
Ambridge,Pa. W18 .....8.775
BeaverFalls,Pa. M12,R2 .8.775
Bethlehem,Pa. B2 .....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 .....8.775
Camden,N.J. P13 .....8.95
Canton,O. T7 .....8.775
Carnegie,Pa. C12 .....8.775
Chicago W18 .....8.775
Cleveland A7, C20 .....8.775
Detroit B5, P17 .....8.975
Detroit S41 .....8.775
Donora,Pa. A7 .....8.775
Elyria,O. W8 .....8.775
FranklinPark,Ill. N5 .....8.775
Gary,Ind. R2 .....8.775
GreenBay,Wis. F7 .....8.775
Hammond,Ind. J5, L2 ..8.775
Hartford,Conn. R2 .....9.075
Harvey,Ill. B5 .....8.775
Hackawanna,N.Y. B2 ..8.775
LosAngeles P2, S30 ....10.75
Mansfield,Mass. B5 .....9.075
Massillon,O. R2, R8 ....8.775
Midland,Pa. C18 .....8.775
Monaca,Pa. S17 .....8.775
Newark,N.J. W18 .....8.95
Plymouth,Mich. P5 .....8.975
S.Chicago,Ill. W14 .....8.775
SpringCity,Pa. K3 .....8.95
Struthers,O. Y1 .....8.775
Warren,O. C17 .....8.775
Waukegan,Ill. A7 .....8.775
Worcester,Mass. A7 .....9.075
Youngtown F3, Y1 .....8.775

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....5.425
Atlanta A11 .....5.625
Birmingham C15, S42 ..5.45
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Lackawanna,N.Y. B2 ..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ...5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2 .5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Johnstown,Pa. B2 ....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ....7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy.(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 .5.325
ChicagoHts.(4)(44) I-2 .5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O.(3) P11 .....5.325
Tonawanda(3) R12 ...5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

Ala.City,Ala. R2 .....4.925
AllenportPa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 .....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill. (8)G4 ..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 .....4.925
SparrowsPoint,Md. B2 .4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ...4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.(19 Ga. & Lighter)

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 ....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 .....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ...7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 .7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

Alabama,City,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled High-Strength, Low-Alloy

Cleveland J5, R2 .....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ....10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	7.70	...
Pittsburgh J5	6.95	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 .. 7.20

SHEETS, Galvanized Steel Hot-Dipped

Ala.City,Ala. R2 ....6.60‡
Ashland,Ky. A10 ....6.60†
Canton,O. R2 .....6.60‡
Dover,O. R1 .....6.60†
Fairfield,Ala. T2 ....6.60†
Gary,Ind. U5 .....6.60*
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60†
Irvin,Pa. U5 .....6.60*
Kokomo,Ind. C16 ....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 .....6.60†
SparrowsPt.,Md. B2 ..6.60†
Warren,O. R2 .....6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 ..... 7.00
Irvin,Pa. U5 ..... 7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 ..... 6.85
Middletown,O. A10 .... 6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 .....7.425
Weirton,W.Va. W6 ..7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ...8.475
Yorkville,O. W10 ....8.475

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 ..... 7.00
Mansfield,O. E6 ..... 7.00
Middletown,O. A10 .... 7.00
Niles,O. M21, S3 .... 7.00
Warren,O. R2 ..... 7.00
Weirton,W.Va. W6 .... 7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key to Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman & Scott
M21 Mallory-Sharon Titanium Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	5.125
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo (27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa. (25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Pittsburg,Calif. C11	5.675
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	6.35
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill. (1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor, Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia(45) P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y. (32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J. (31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.55
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1		10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70		
Detroit D2	9.05	10.50	12.70	15.70	
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60		
Fostoria,O. S1	10.05	11.15	13.10	16.10	
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18			12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	
LosAngeles J5	11.15	12.60	14.80		
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	
New York W3		10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5		10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10		
Fostoria,O. S1	18.30	22.15	
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
New York W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10		
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

SILICON STEEL

H.R.SHEETS(22 Ga.,cut lengths)	Field	ture Arma-	tric Elec-	Motor	mo Dyna-
BeechBottom,W.Va. W10			11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	
Vandergrift,Pa. U5		11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	
Zanesville,O. A10		11.10	11.80	12.90	13.95
Zanesville,O. A10 (SP Coils)			11.55	12.65	13.70

C.R. COILS & CUT LENGTHS (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10		11.35	12.05	13.15	14.20
Brakenridge,Pa. A4			12.05	13.15	14:20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	
IndianaHarbor,Ind. I-2	9.625*	10.85*	11.55*	12.65*	
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10(FP Coils)		11.35	12.05	13.15	14.20

H.R. SHEETS (22Ga., cut lengths)	Transformer Grades T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brakenridge,Pa. A4	17.60	19.20	19.70	20.20		
Butler,Pa. A10			19.20	19.70	20.20	
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2						15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower.

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvananized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdalle,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	7.725	7.925	
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Irvin,Pa. U5	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2,Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.85
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24)‡ S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester A7, J4, T6	9.60

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P7, P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock — **Col.**

AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville, Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla.(20) M8	184
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES — **Col.**

AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	177
Fairfield,Ala. T2	175
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
Kokomo,Ind. C6	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet, Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S. SanFrancisco C10	11.40
SparrowsPt., Md. B2	10.70
Sterling,Ill.(37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill(37) N15	10.75

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	219
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg, Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214
Williamsport,Pa. S19	175

FENCE POSTS

Birmingham C15	171
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	171
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	193••
Aliquippa,Pa. J5	190§
Atlanta A11	198•
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198••
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198••
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198••
Monessen,Pa. P7	196•
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193••
S.SanFrancisco C10	213••
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198§

WOVEN FENCE, 9-15 Ga. — **Col.**

Ala.City,Ala. R2	187••
Allq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192•
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192••
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192••
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192••
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187••
Sterling,Ill.(7) N15	192§

WIRE (16 gage)	An'ld Galv. Stone	Stone
Ala.City,Ala.R2	17.15	18.70••
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95••
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95••
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05§
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	8.65 9.20••
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	8.75 9.425•
Bartonville(48) K4	8.75 9.425
Buffalo W12	8.65 9.20†
Cleveland A7	8.65 ....
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	8.65 9.20†
Duluth A7	8.65 9.20†
Fairfield T2	8.65 9.20†
Houston(48) S5	8.90 9.45••
Jacks'ville.Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	8.65 9.20†
Kans.City(48) S5	8.90 9.45••
Kokomo C16	8.75 9.30†
LosAngeles B3	9.60 10.275§
Minnequa C10	8.90 9.45••
Monessen P7(48)	8.65 9.25•
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	9.60 10.15†
Rankin,Pa. A7	8.65 9.20†
S.Chicago R2	8.65 9.20••
S.SanFran. C10	9.60 10.15••
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575§
Sterling(1)(48)	8.80 9.475§
Struthers,O.(48)Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: •13.50, †5c, §10c, ‡Less than 10c. ††10.50c. ••Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1¼ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or Longer than 6 in.	39.0

Blank Bolts 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 3 in. and shorter	55.0
⅝ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes 55.5

Square Nuts, Reg. &

Heavy, Hot Galvanized:

All sizes 41.0

Hex Nuts, Reg. &

Heavy, Hot Pressed:

¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. &

Heavy, Cold Punched:

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

Semifinished Hex Nuts, Reg. (Incl. Slotted):

⅝ in. and smaller	60.5
⅞ in. to 1 in., incl.	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:

⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+6.0

High Carbon, Heat Treated:

6 in. and shorter:

⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller	+13.0
¾, ⅞, and 1 in. diam.	+32.0

Flat Head Capscrews:

¾ in. and smaller +76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:

6 in. and shorter	Net
Longer than 6 in.	+23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	....(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C1'	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala.	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1½" to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 13 Ga. and heavier.
(9) Merchant quality; and 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld in mill zone or within switching limits, 5.885c.
(43) 9-14½ Ga.
(44) To fabricators.
(45) 0.022 in. and lighter, over 0.022", 8.20c.
(48) 6-7Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	....	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	....	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.50	55.50
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	63.25
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	....	....	86.50	....	92.75	....	104.50
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	81.50	81.50
316L	....	....	70.00	76.50	77.00	80.75	84.50	89.25	89.25
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	106.75	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.25	48.25	48.25
420	....	33.50	34.25	41.75	39.25	41.25	45.25	62.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	51.75
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McInnes Steel Co.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Iolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	40.00
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.40	49.50	54.50	58.75
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.90	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.95	40.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
AlabamaCity,Ala. R2	62.00	62.50	....	....
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala. W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y. T9	....	66.50	67.00	67.50
Tonawanda,N.Y. W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	....	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	68.62	69.12	69.12	69.62
Muskegon,Mich., deld.	....	74.12	74.12	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	66.50	67.00	67.50	....
Swedeland,Pa. A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.10	75.60	....
Newark,N.J., deld.	72.29	72.79	73.29	73.79
Philadelphia, deld.	70.01	70.51	71.01	71.59
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa. S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	70.90	....	71.40	71.90
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls,N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry, $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry, 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.27
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.61	....	8.76	9.06	11.34 #	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90 #	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90 #	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.00	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.05	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	9.95	52.33	8.33	8.69	10.80 #	14.74	9.01	8.79	10.11
Dallas	8.85	10.15	....	....	9.00	8.95	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	9.82	9.74	11.06
Detroit	8.43	9.70	10.35	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	8.45	9.75	8.45	....	8.60	8.55	11.10	....	8.60	9.05	10.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	7.85	10.75	11.65	57.60	7.80	7.95	12.00	....	7.85	7.80	9.95
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96 #	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.13	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.35	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76 #	15.09	9.35	9.43	10.71
Norfolk, Va.	8.05	....	....	....	8.55	8.60	10.80	....	8.95	8.45	9.95
Philadelphia	8.00	8.90	9.87	52.69	8.69	8.65	11.51 #	15.01	8.50	8.77	9.77**
Pittsburgh	8.18	9.45	10.35	52.00	8.33	8.60	10.80 #	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.45	....	10.40	....	9.15	9.15	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.61	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45	9.70	13.00	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.00	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡‡over 4 in.; §§over 3 in.; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg. 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [8]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill. Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Pa., $245.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Philadelphia, Clearfield, Orviston, Pa., $305.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Philadelphia, Clearfield, Orviston, Pa., $345.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1957 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	27.00-27.50
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	28.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$13.00-14.00*
Domestic, concentrates f.o.b. milling points	20.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.39-1.42 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$51.00-53.00
48% 2.8:1	48.00-50.00
48% no ratio	41.00-43.00

South African Transvaal

48% no ratio	$40.00-41.00
44% no ratio	30.00-30.50

Turkish

48% 3:1	$55.00-57.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over.. F.o.b. Riverton or Camden, N. J., west of Mississippi River	10.50 / 9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over F.o.b. Riverton, N. J., west of Mississippi River	10.50 / 9.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)..	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500 lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500 lb lots	42.00*
Brass, 5000-lb lots	31.30-38.40†
Bronze, 5000-lb lots	48.10-52.70†
Copper: Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.065
Nickel-Silver, 5000-lb lots	49.20-61.30†
Phosphor-Copper, 5000-lb lots	59.80
Copper (atomized) 5000-lb lots	40.30-48.80‡
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.02
Stainless Steel, 316	$1.20
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡

Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5¼	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.25
Saginaw, Mich., deld.	33.83
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.24
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

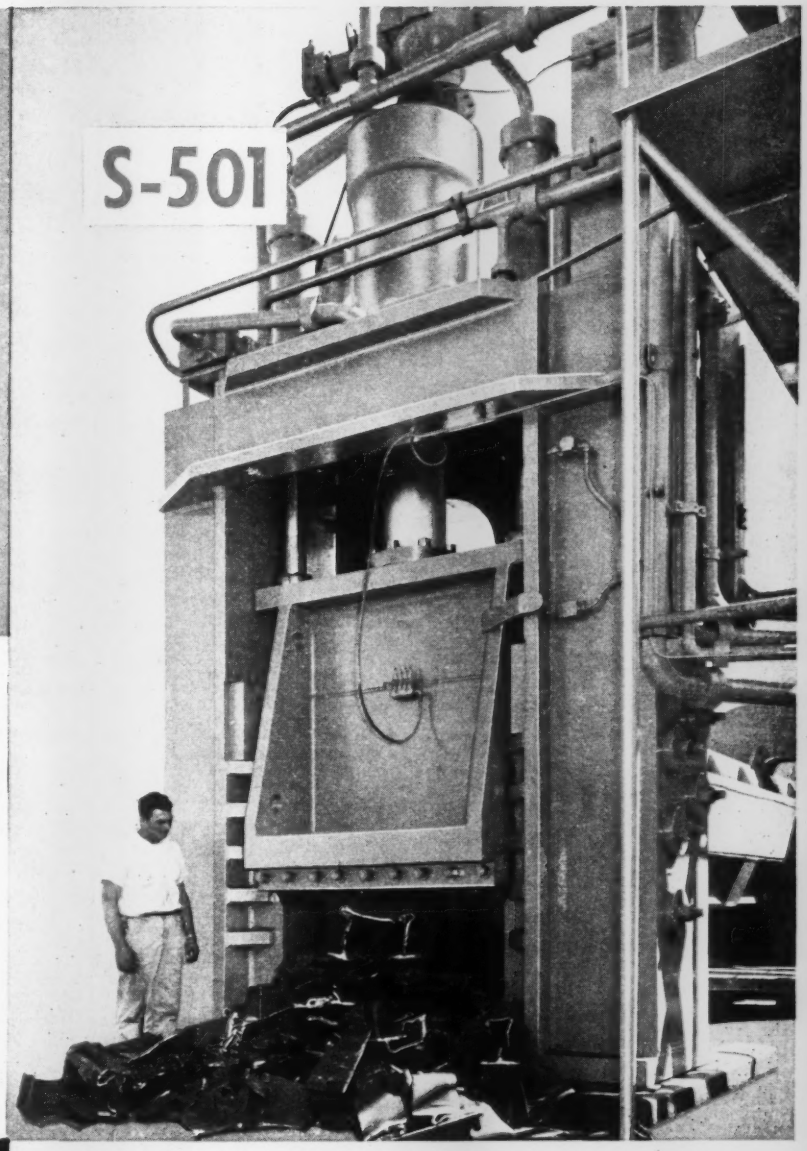
Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.68	$5.63	$5.68	$5.93
Bar Size Angles	5.98	5.93	5.98	6.23
Structural Angles	5.98	5.93	5.98	6.23
I-Beams	6.43	6.39	6.43	6.68
Channels	6.43	6.39	6.43	6.68
Plates (basic bessemer)	7.64	7.59	7.64	7.88
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	26.79	26.67	26.67	27.36
Barbed Wire (†)	6.95	6.95	6.95	7.40
Merchant Bars	6.37	6.32	6.37	6.61
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (‡)	8.12	8.12	8.12	8.32

†Per 82 lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.

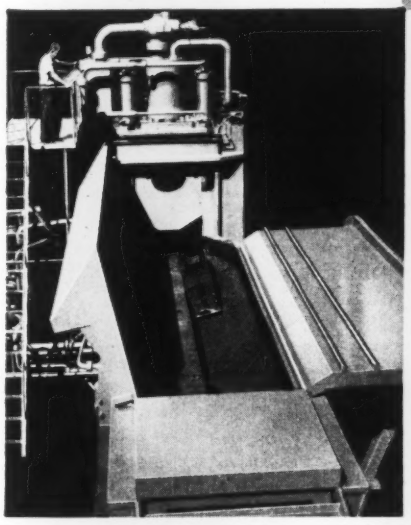
CUTS 200 TONS PLATE SCRAP IN EIGHT HOURS



production is continuous

labor costs 70% lower

The Harris Shear is revolutionary in design. It is the first new development in the scrap industry since the introduction of the Baling Press. Railroad scrap, pipe, farm, industrial, automobile and miscellaneous junk shop scrap work through on a 12 second cycle. A 3 man crew and a crane handle the job in all kinds of weather.



The charging box is 264" x 80" x 30". It has a flat type loading hopper. The cover and charging ram operate like a baler. This means more material under each stroke of the knife.

The Harris Shear brings new profits to Scrap Yards

HARRIS FOUNDRY & MACHINE CO.

Hydraulic Engineers Since 1889

CORDELE, GEORGIA

▶ *Talk with a Man from Harris*

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton. Palmerton, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx). Base price per net ton: $245. Johnstown, Duquesne, Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74% respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67.71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8M x D, 21.25c. per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35%-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c, per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags, 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l. bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c; (Small size—weighing approx 2½ lb and containing 1 lb of Si.) Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l. pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.95 per lb of contained W; 2000 lb W to 5000 lb W, $3.05; less than 2000 lb W, $3.17. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8 % max, C 0.4% max). Contract, ton lot 2" x D, $4.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $4.25 per lb of contained Cb plus Ta, delivered; less ton lot $4.30.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works. Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

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UNITED STATES STEEL

(Concluded from Page 112)

wick, N. J., Brann & Stuart, Trenton, N. J., general contractor.

200 tons, South Seattle highway project, to Leckenby Structural Steel Co., Seattle; John P. Hopkins, Mercer Island, general contractor.

175 tons, loading equipment, Port of Longview, Wash., grain elevator, to Poole, McGonigle & Dick, Portland, Oreg.

160 tons, utility supports at Bethlehem's Seattle plant, to Leckenby Structural Steel Co., Seattle.

150 tons, Moses Lake, Wash., high school, to Leckenby Structural Steel Co., Seattle; Purvis Construction Co., general contractor.

150 tons, Greyhound Bus Terminal, Tacoma, Wash., to Pacific Car & Foundry Co., Seattle; Dolph Jones, Tacoma, Wash., general contractor.

STRUCTURAL STEEL PENDING

1200 tons, Grant County, Washington, P.U.D. Priest Rapids, 230-kv transmission line and equipment; Key Construction Co., low bidder.

460 tons, including 350 tons of low alloy, Park Road Bridge, over Piney Branch Parkway, District of Columbia; also 175 tons, concrete reinforcing bars.

430 tons, Hawthorne Street Bridge approaches, Portland, Oreg.; Kuckenberg Construction Co., Portland, Oreg., low bidder at $758,182 to Multnomah County commissioners.

316 tons, also 31 tons of reinforcing, Washington state truss bridge, Yakima County; bids to Olympia, Wash., Feb. 4.

300 tons, Oregon state, Yamhill River Bridge, bids in.

230 tons, Oregon state, Sandy River Bridge, bids in.

140 tons, Swift power project, Washington, Brandon Co., Vancouver, Wash., low for switchyard installation.

117 tons, also 25 tons of reinforcing, Washington state, Clark County railroad underpass, bids to Olympia, Wash., Feb. 4.

100 tons, also 50 tons of reinforcing and unstated tonnage of steel piling, two bridges, Mt. McKinley National Park, Alaska; bids to Bureau of Public Roads, Juneau, Alaska, Feb. 11.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1130 tons, U. S. Engineers, San Francisco, to Southwest Steel Rolling Mills, Los Angeles.

690 tons, U. S. Engineers, San Francisco, to Western Rolling Mills, San Jose, Calif.

570 tons, student facility center, Fordham University, New York, to Fabricators Steel & Mfg. Corp., New York; John Kennedy & Co. Inc., New York, general contractor.

450 tons, state highway trestle structure, Manahawkin Bay, Stafford-Ship Bottom, N. J., to Bethlehem Steel Co., Bethlehem, Pa.; Brann & Stuart, Trenton, N. J., general contractor.

200 tons, Texas Co. oil terminal, Anacortes, Wash.; Moses Lake, Wash., school and Montana state highway project, to Bethlehem Pacific Coast Steel Corp., Seattle.

200 tons, Washington state library building, Olympia, Wash., to James D. English Steel Co., Tacoma, Wash.; Kuney-Johnson Co., Seattle, general contractor.

140 tons, high school, Camp Hill, Pa., to Brocker Mfg. & Supply Co., York, Pa.; H. B. Alexander & Son, Harrisburg, Pa., general contractor.

130 tons, six-span composite rolled beam bridge, Naugatuck River, Ansonia, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; Mariani Construction Co., New Haven, Conn., general contractor; 435 tons, fabricated structurals to McDermott Steel Specialties Co., North Haven, Conn.

120 tons, three-span bridge, Farmington River, New Hartford-Canton, Conn., to Scherer Steel Co., East Hartford, Conn.; Oneglia & Gervasini Inc., Torrington, Conn., general contractor.

110 tons, state highway structure, Schenectady, N. Y., to Albany Steel & Iron Co., Albany, N. Y.; Collins Bros. Inc., Mechanicville, N. Y., general contractor; 80 tons of fabricated structural steel to Ernst Iron Works, Buffalo.

PLATES . . .

PLATES PLACED

270 tons, General Stores Supply, Navy, Philadelphia, to Lukens Steel Co., Coatesville, Pa.

270 tons, medium tensile, hull plates, Navy Purchasing Office, Washington, D. C., to Bethlehem Steel Co., Bethlehem, Pa.

240 tons, General Stores Supply, Navy, Philadelphia, to Alan Wood Steel Co., Conshohocken, Pa.

220 tons, General Stores Supply, Navy, to U. S. Steel Corp., Pittsburgh.

165 tons, General Stores Supply, Navy, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.; also 290 tons, sheets, same supplier.

155 tons, General Stores Supply, Navy, Philadelphia, to Kaiser Steel Co., New York.

100 tons, north trunk sewer cofferdam, Seattle, to Big Bend Inc., Seattle; $29,300.

PLATES PENDING

200 tons, 45,000-bbl storage tank, Dow Air Force Base, Bangor, Maine; bids about Feb. 6, U. S. Engineers, Boston.

150 tons, low alloy, high tensile hull plates, General Stores Supply, Navy, Philadelphia; bids Jan. 28.

100 tons, water and oil tanks, 110,000-gal storage capacity, Naval Supply Depot, Newport, R. I.

1165 tons, 300,000-gal storage tank with double-deck floating roof, Ethan Allen Air Force Base, Burlington, Vt.; bids about Feb. 11, U. S. Engineers, Boston.

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Scrap Price Composite Advancing

STEEL's index on the prime grade goes up 92 cents to $34.25, highest level since last October. Stronger market tone is attributable to growing dealer resistance to brokers' offering prices

Scrap Prices, Page 126

Chicago—The upward pressure on scrap prices in this area is the result of broker buying from dealers as they seek material to fill old orders. A mill which had threatened to cancel tonnage not delivered in December extended the deadline to Jan. 30. These orders involve the better open hearth grades; such material is not freely available with steel operations at reduced rates. The original orders for the scrap were placed at prices above the recent deflated level. Brokers can afford to offer dealers several dollars a ton more without being out of pocket. A pickup in mill buying cannot be foreseen this month or next. The stronger market tone is scarcely an indication of expanding steelmaking in the near future.

Philadelphia—The market on the steelmaking grades of scrap appears a little stronger here. No. 1 melting, No. 1 bundles, and No. 1 busheling are up slightly to $37-$38.50. Electric furnace bundles are also up, being quoted at $38.50. Prices on all other grades are unchanged. The strike at the Camden, N. J., yard is over. The workmen returned to their jobs Jan. 20.

New York — Brokers' buying prices on the major steel grades of scrap are up slightly. No. 1 heavy melting and No. 1 bundles are now quoted $34-$35, No. 2 heavy melting $30-$31, No. 2 bundles $22-$23. Other grades are unchanged.

Boston—A firmer tone is developing in the scrap market here. Brokers have advanced their buying prices on No. 1 heavy melting, No. 1 bundles and No. 1 busheling to $24-$25, up $1 from a week ago. No. 2 heavy melting now is quoted $22-$23, No. 2 bundles, $17.50-$18, and mixed borings and turnings, $9.50-$10.

Pittsburgh—An area mill continues to purchase No. 2 bundles at $29 a ton, and indications are that the price is stabilized at that level. There is little demand for other grades. Rail prices are off in the latest railroad lists.

Cleveland—Trading is at a virtual standstill here and in the Valley. Except for growing dealer resistance to brokers' offering prices, the market is unchanged from what it was a week ago. Recent railroad lists have offered smaller tonnages, and expectations are tonnage in the month-end automotive lists will be down.

Detroit — Scrap prices moved slightly upward again last week on the basis of a couple small orders for No. 1 and No. 2 bundles. When auto lists come out this week, the industry expects to see more buying by local brokers simply to keep out-of-state brokers from picking up local scrap—currently, it is lower priced than scrap at Cleveland or Chicago.

The long range outlook is gloomy. Turnings are not moving. Local dealers and brokers say that if the auto industry is struck this summer, scrap prices will fall to lower levels.

Buffalo—Relatively light tonnages of scrap are moving on mill orders placed recently at lower prices. The low level of the market and continued cold weather are discouraging collections by peddlers. Another factor cutting into scrap supplies is reduced operations at metalworking plants.

Cast iron scrap is providing a bright spot in the local market picture.

The market for No. 1 heavy melting steel appears definitely established at $28-$29.

Cincinnati — Scrap prices are holding despite the absence of buying interest. Brokers think February purchasing programs will be "modest." But they expect to have a hard time filling orders because of growing dealer resistance to offering prices.

Birmingham — Indications of a possible turn in the market are seen by local dealers in a limited purchase of No. 2 heavy melting steel by an Alabama mill at $2 per ton above the price paid on its previous purchase. Quotations on other open hearth grades of scrap are unchanged but appear to be firmer.

Los Angeles—Buyer interest remains at low ebb; scrap prices are soft. Though brokers are holding to recently established price levels, they are not firm because of the absence of active demand.

Seattle — A slightly stronger market in the East has not firmed up the scrap market in this area.

Washington — November consumption of ferrous materials totaled 9,840,000 gross tons (4,799,000 tons of scrap and 5,041,000 tons, pig iron), reports the U. S. Bureau of Mines. This was the smallest amount consumed in any uninterrupted monthly operation since November, 1955.

Stocks (scrap and pig iron) totaled 11,220,000 tons at the end of November, second highest total on record despite a decrease from the end of the preceding month. Scrap stocks amounted to 7,961,000 tons and pig iron, 3,259,000. Both were off 2 per cent from October tonnages held in inventory.

Pig Iron Sets New Record

Blast furnace production (pig iron, ferromanganese, and spiegeleisen) set an annual record at 79,339,671 net tons in 1957, reports the American Iron & Steel Institute. The total compares with 75,959,560 tons produced in 1956 and is 1.5 million tons over the former record of 77,789,684 tons produced in 1955.

Output during December was 5,279,380 net tons against 5,779,879 in November, and 7,335,507 in December, 1956.

The institute's revised figure for 1957 steel production is 112,714,996 net tons, about 7000 more than was indicated in its preliminary report. The revised figure for December is 7,420,285 net tons.

Pig Iron . . .

Pig Iron Prices, Page 119

Demand for pig iron on the part of foundries continues to decline. Operating on three or four day

(*Please turn to Page* 131)

Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Jan. 22, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Jan. 22	$34.25
Jan. 15	33.33
Dec. Avg.	32.77
Jan. 1957	58.96
Jan. 1953	43.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	30.00-31.00
No. 1 factory bundles	35.00-36.00
No. 1 dealer bundles	32.00-33.00
No. 2 bundles	28.00-29.00
No. 1 busheling	32.00-33.00
Machine shop turnings	17.00-18.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	21.00-22.00
Cast iron borings	21.00-22.00
Cut structurals:	
2 ft and under	*37.00-38.00*
3 ft lengths	*36.00-37.00*
Heavy turnings	31.00-32.00
Punchings & plate scrap	*36.00-37.00*
Electric furnace bundles	*36.00-37.00*

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	37.00-38.00
Unstripped motor blocks	26.00-27.00
Clean auto cast	42.00-43.00
Drop broken machinery	49.00-50.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00-38.00
Rails, 2 ft and under	*55.00-56.00*
Rails, 18 in. and under	*56.00-57.00*
Angles, splice bars	*46.00-47.00*
Rails, rerolling	*56.00-57.00*

Stainless Steel Scrap

18-8 bundles & solids	195.00-200.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

CLEVELAND

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	21.00-22.00
No. 1 factory bundles	31.00-32.00
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
No. 1 busheling	27.00-28.00
Machine shop turnings	11.00-12.00
Short shovel turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Cast iron borings	15.00-16.00
Cut foundry steel	32.00-33.00
Cut structurals, plates 2 ft and under	36.00-37.00
Low phos. punchings & plate	29.00-30.00
Alloy free, short shovel turnings	19.00-20.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Charging box cast	34.00-35.00
Heavy breakable cast	32.00-33.00
Stove plate	39.00-40.00
Unstripped motor blocks	24.00-25.00
Brake shoes	31.00-32.00
Clean auto cast	43.00-44.00
Burnt cast	29.00-30.00
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	*33.50-34.50*
R.R. malleable	55.00-56.00
Rails, 2 ft and under	55.00-56.00
Rails, 18 in. and under	56.00-57.00
Rails, random lengths	48.00-49.00
Cast steel	45.00-46.00
Railroad specialties	46.00-47.00
Uncut tires	39.00-40.00
Angles, splice bars	46.00-47.00
Rails, rerolling	54.00-55.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

YOUNGSTOWN

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	30.00-31.00
No. 2 bundles	24.00-25.00
No. 1 busheling	30.00-31.00
Machine shop turnings	13.00-14.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Low phos.	33.00-34.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.50-37.50*

CHICAGO

No. 1 heavy melt., indus.	*33.00-34.00*
No. 1 hvy melt., dealer	*31.00-32.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 factory bundles	*35.00-36.00*
No. 1 dealer bundles	*31.00-32.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling, indus.	*33.00-34.00*
No. 1 busheling, dealer	*31.00-32.00*
Machine shop turnings	*17.00-18.00*
Mixed borings, turnings	*19.00-20.00*
Short shovel turnings	*19.00-20.00*
Cast iron borings	*19.00-20.00*
Cut structurals, 3 ft	42.00-43.00
Punchings & plate scrap	43.00-44.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	*34.00-35.00*
Unstripped motor blocks	31.00-32.00
Clean auto cast	45.00-46.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*36.00-37.00*
R.R. malleable	48.00-49.00
Rails, 2 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Angles, splice bars	49.00-50.00
Axles	*50.00-51.00*
Rails, rerolling	*50.00-51.00*

Stainless Steel Scrap

18-8 bundles & solids	*175.00-185.00*
18-8 turnings	80.00-90.00
430 bundles & solids	80.00-90.00
430 turnings	47.50-52.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.00-23.00*
No. 2 heavy melting	*17.00-18.00*
No. 1 bundles	*22.00-24.00*
No. 2 bundles	16.00-17.00
No. 1 busheling	19.00-20.00
Machine shop turnings	7.00-8.00
Mixed borings, turnings	8.00-9.00
Short shovel turnings	9.00-10.00
Punchings & plate scrap	25.00-26.00

Cast Iron Grades

No. 1 cupola	29.00
Stove plate	23.00
Charging box cast	23.00
Heavy breakable	22.00
Unstripped motor blocks	14.00
Clean auto cast	30.00
Malleable	31.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	32.00
No. 2 heavy melting	29.00
No. 1 bundles	32.00
No. 1 bundles	22.00†
No. 1 busheling	32.00
Machine shop turnings	14.50
Short shovel turnings	16.50

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	32.00
Heavy breakable cast	32.00
Unstripped motor blocks	32.00
Clean auto cast	44.00
Stove plate	37.00

Railroad Scrap

No. 1 R.R. heavy melt.	37.00
Rails, 18 in. and under	48.00
Rails, random lengths	45.00
Rails, rerolling	51.00
Angles, splice bars	46.00

Nominal

PHILADELPHIA

No. 1 heavy melting	*37.00-38.50*
No. 2 heavy melting	34.00
No. 1 bundles	*37.00-38.50*
No. 2 bundles	27.00
No. 1 busheling	*37.00-38.50*
Electric furnace bundles	*38.50*
Mixed borings, turnings	22.50
Short shovel turnings	24.00
Machine shop turnings	22.00
Heavy turnings	31.00
Structurals & plate	40.00-41.00
Couplers, springs, wheels	46.00
Rail crops, 2 ft & under	58.00-60.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	39.00
Malleable	56.00
Drop broken machinery	49.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	*30.00-31.00*
No. 1 bundles	*34.00-35.00*
No. 2 bundles	*22.00-23.00*
Machine shop turnings	11.00-12.00
Mixed borings, turnings	12.00-13.00
Short shovel turnings	14.00-15.00
Low phos. (structurals & plate)	45.00-46.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Unstripped motor blocks	32.00
Heavy breakable	32.00-33.00

Stainless Steel

18-8 sheets, clips, solids	150.00
18-8 borings, turnings	50.00
410 sheets, clips, solids	60.00-65.00
430 sheets, clips, solids	75.00-80.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*22.00-23.00*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*17.50-18.00*
No. 1 busheling	*24.00-25.00*
Machine shop turnings	9.50-10.00†
Mixed borings, turnings	*9.50-10.00*
Short shovel turnings	11.00-11.50†
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	35.00-36.00

BUFFALO

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	28.00-29.00
No. 2 bundles	23.00-24.00
No. 1 busheling	28.00-29.00
Mixed borings, turnings	14.00-15.00
Machine shop turnings	12.00-13.00
Short shovel turnings	15.00-16.00
Cast iron borings	14.00-15.00
Low phos.	32.00-33.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	36.00-37.00
No. 1 machinery	41.00-42.00

Railroad Scrap

Rails, random lengths	39.00-40.00
Rails, 3 ft and under	46.00-47.00
Railroad specialties	33.00-34.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	28.00-29.00
No. 2 bundles	21.00-22.00
No. 1 busheling	28.00-29.00
Machine shop turnings	13.00-14.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	16.00-17.00
Cast iron borings	15.00-16.00
Low phos. 18 in.	36.00-37.00

Cast Iron Grades

No. 1 cupola	36.00-37.00
Heavy breakable cast	33.00-34.00
Charging box cast	33.00-34.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	42.00-43.00

BIRMINGHAM

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	31.00-32.00
No. 2 bundles	16.00-17.00
No. 1 busheling	31.00-32.00
Cast iron borings	12.00-13.00
Short shovel turnings	23.00-24.00
Machine shop turnings	22.00-23.00
Bar crops and plates	39.00-40.00
Structurals & plate	39.00-40.00
Electric furnace bundles	36.00-37.00
Electric furnace:	
3 ft and under	35.00-36.00
2 ft and under	36.00-37.00

Cast Iron Grades

No. 1 cupola	49.00-50.00
Stove plate	48.00-49.00
Unstripped motor blocks	39.00-40.00
Charging box cast	22.00-23.00
No. 1 wheels	37.00-38.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
Rails, 18 in. and under	48.00-49.00
Rails, rerolling	48.00-49.00
Rails, random lengths	41.00-42.00
Angles, splice bars	*42.00-43.00*

SEATTLE

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	29.00
No. 2 bundles	21.00
Machine shop turnings	22.00
Mixed borings, turnings	22.00
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	36.00
No. 2 heavy melting	34.00
No. 1 bundles	32.00
No. 2 bundles	24.00
Machine shop turnings	12.00
Shoveling turnings	15.00
Cast iron borings	15.00
Cut structurals and plate 1 ft and under	48.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00

SAN FRANCISCO

No. 1 heavy melting	34.00
No. 2 heavy melting	32.00
No. 1 bundles	30.00
No. 2 bundles	24.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Cast iron borings	16.00
Heavy turnings	16.00
Short shovel turnings	16.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	36.00
Stove plate	36.00
Heavy breakable cast	30.00
Unstripped motor blocks	33.00
Clean auto cast	42.00
Drop broken machinery	42.00
No. 1 wheels	36.00

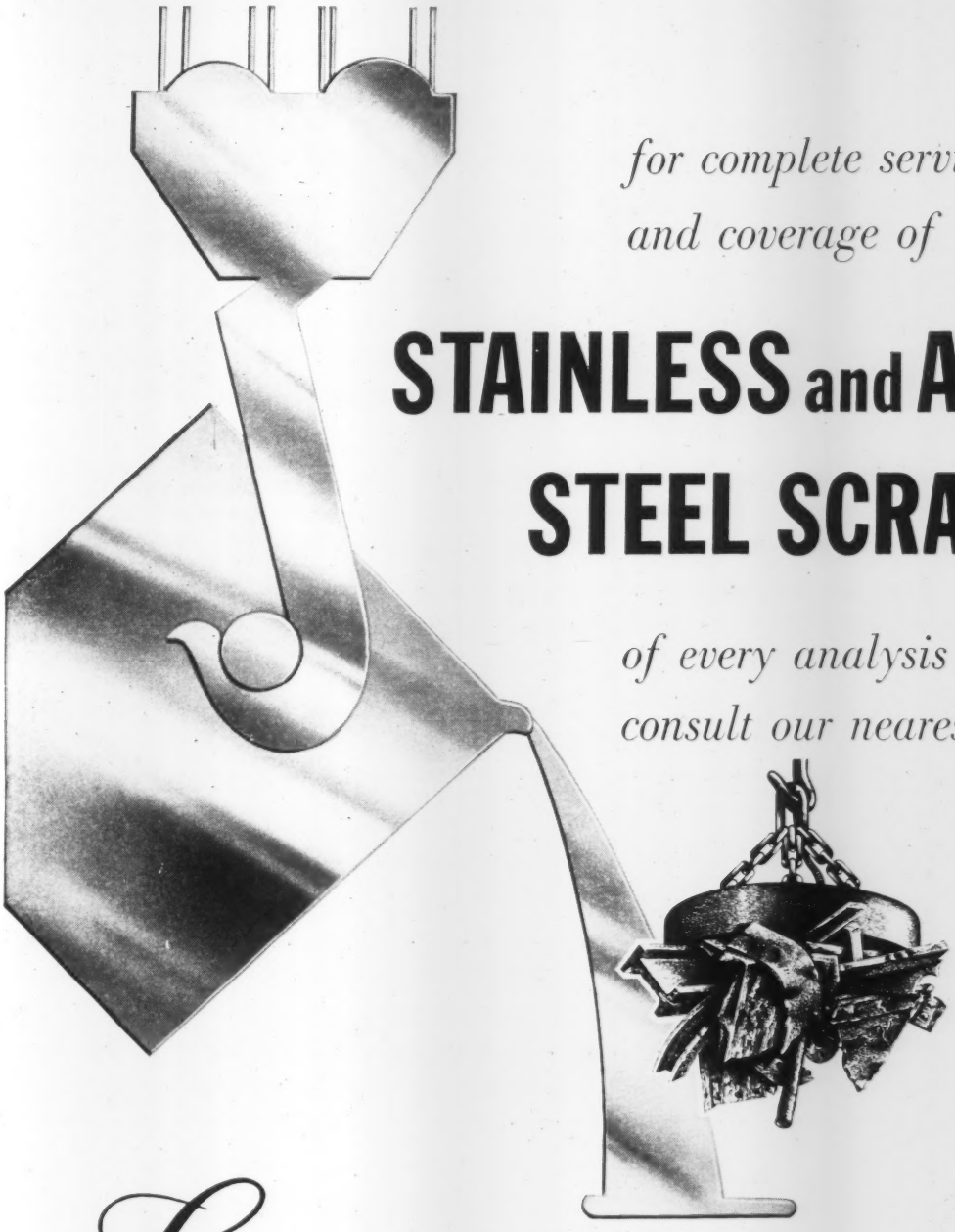
HAMILTON, ONT.

No. 1 heavy melting	32.00
No. 2 heavy melting	27.00
No. 1 bundles	32.00
No. 2 bundles	22.00
Mixed steel scrap	27.00
Mixed borings, turnings	17.00
Busheling, new factory:	
Prepared	32.00
Unprepared	26.00
Short steel turnings	21.00

Cast Iron Grades†

No. 1 machinery cast	45.00-50.00

†F.o.b. Hamilton, Ont.



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Copper Tariff Urged

Mine state groups in House and Senate ask for 4 cent a pound import duty whenever price falls below 30 cents. But current Congressional sentiment runs counter to such a move

Nonferrous Metal Prices, Pages 130 & 131

COPPER STATE lawmakers, long irked by low priced imports, have petitioned Congress for relief. The 2 cent a pound drop in the domestic price on Jan. 13 was the final blow as far as the western congressmen were concerned.

Result: Groups in the House and Senate are co-sponsoring bills to place a tax of 4 cents a pound on copper imports whenever the domestic price falls under 30 cents a pound. It's now 25 cents.

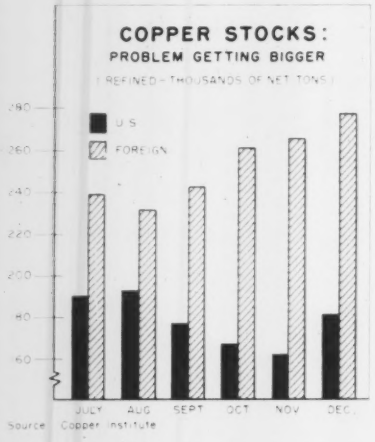
Troubles—Any current move to hike tariffs or institute peril points is in for a hard fight. Rep. Stewart L. Udall (D., Ariz.), one of the bill's sponsors, told STEEL that Congressional sentiment is toward liberalization of the Reciprocal Trade Act rather than higher tariffs. "Reciprocal trade must be encouraged," he said. "But when the bottom drops out of a domestic industry, we have to establish some sort of cushion."

Representative Udall said the chances of the bills being endorsed by the House Ways & Means Committee are hampered by the committee's action last summer when it refused to recommend tariff relief for lead and zinc. "Some committee members feel it would be inconsistent to handle copper differently," he told STEEL.

Relief — Under existing legislation, a 1.7 cent a pound import excise tax goes on after June 30 if the domestic copper price is 24 cents or more a pound. If the price is under 24 cents, the tax becomes 2 cents a pound. Last year Congress suspended the tax, but no such move is likely this year, says Representative Udall.

Copper Price Down Again

Custom smelted copper took another half cent dip (to 24 cents a pound) on Jan. 21. The move came as no surprise to metalmen (see STEEL, Jan. 20, p. 118) who had felt right along that custom smelters couldn't stay only a half cent under the primary price unless demand picked up.



On the bright side, there's some indication the industry may be facing up to its overproduction problem.

Since Chile announced on Jan. 13 that she had authorized a 10 per cent curtailment in production, copper circles have been predicting similar moves in other areas. Latest move by an overseas producer is Katanga's decision to mine 222,000 tons of copper in 1958. That's 18,000 tons less than its 1957 figure and 25,000 tons less than it mined in 1956.

On the domestic scene, Phelps Dodge Corp. plans to cut current production by 9 per cent. (Although the company doesn't specify a figure, it should be around 1800 tons monthly.) Robert G. Page, president, says the cumulative decrease in output since October, 1956, amounts to 22 per cent.

Metal Statistics for '57

Final statistics of the Copper Instiute show 1957 world refined production at 3,032,531 tons, vs. 2,987,160 tons in 1956. Domestic production rose some 33,000 tons to the 1,613,907 ton mark. While world deliveries to fabricators came to 2,850,064 tons, a slight gain, domestic shipments fell from 1,465,999 tons in '56 to 1,274,868 tons. The world-wide production gain, plus the slump in demand at home, caused stocks to spiral (see chart).

Primary aluminum production in the U. S. during 1957 totaled 1,649,013 tons, reports the Aluminum Association. Comparison: 1,679,247 tons in 1956.

Market Memos

- American Zinc, Lead & Smelting Co. says its first quarter zinc production will be about 25 per cent (10,000 tons) under the corresponding period in 1957.
- High inventories and reduced demand are the reasons given by Aluminum Co. of America for closing down 3 of 11 potlines at its Alcoa, Tenn., reduction plant.

NONFERROUS PRICE RECORD

	Price Jan. 22	Last Change	Previous Price	Dec. Avg	Nov. Avg	Jan., 1957 Avg
Aluminum ..	26.00	Aug. 1, 1957	25.00	26.000	26.000	25.000
Copper	24.00-25.00	Jan. 21, 1958	24.50-25.00	26.130	26.217	35.433
Lead	12.80	Dec. 2, 1957	13.30	12.800	13.300	15.800
Magnesium .	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	92.625	Jan. 22, 1958	92.00	92.395	89.288	101.480
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

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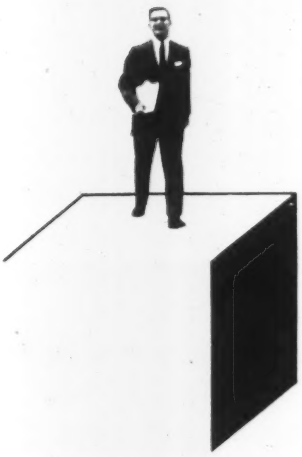

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Aluminum Alloy: No. 13, 29.90; No. 43, 29.70; No. 195, 31.30; No. 241, 31.50; No. 356, 29.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 25.50-26.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-90 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 24.00; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-90 nom. per troy oz.

Lead: Common, 12.80; chemical, 12.90; corroding, 12.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. sticks, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $220-225, per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $76-80 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.50 per lb, commercial grade.

Silver: Open market, 89.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot, 92.625; prompt, 92.25.

Titanium: Sponge, 99.3+ %, grade A-1 ductile (0.3% Fe max.), $2.25; grade A-2 (0.5% Fe max.), $2.00 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99+% hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb. New York basis, add 0.50. High grade, 11.35; special high grade, 11.75 deld. Diecasting alloy ingot No. 3, 14.25; No. 2, 15.25; No. 5, 14.75 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 23.50-25.50; No. 12 foundry alloy (No. 2 grade), 21.50-23.25; 5% silicon alloy, 0.60 Cu max., 25.25-26.25; 13 alloy, 0.60 Cu max., 25.25-26.25; 195 alloy, 24.50-27.00; 108 alloy, 22.00-23.25. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 23.50; grade 2, 21.75; grade 3, 20.50; grade 4, 18.50.

Brass Ingot: Red brass, No. 115, 26.25; tin bronze, No. 225, 35.00; No. 245, 29.75; high-leaded tin bronze, No. 305, 30.25; No. 1 yellow, No. 405, 21.75; manganese bronze, No. 421, 23.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $18.50 per cwt; pipe, full coils, $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $9.50-15.95; sheared mill plate, $8.00-11.50; wire, $7.50-11.50; forging billets, $6.00-7.60; hot-rolled and forged bars, $6.15-7.90.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.00-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100 and 3003 mill finish (30,000 lb base; freight allowed).

Range Thickness Inches	Flat Sheet	Coiled Sheet
0.249-0.136	43.10-47.60	.....
0.135-0.096	43.60-48.70	40.50-41.10
0.095-0.077	44.30-50.50	40.60-41.30
0.076-0.061	44.90-52.80	40.80-42.00
0.060-0.048	45.60-55.10	41.40-43.10
0.047-0.038	46.20-57.90	41.90-44.50
0.037-0.030	46.60-62.90	42.30-46.30
0.029-0.024	47.20-54.70	42.60-47.00
0.023-0.019	48.20-58.10	43.70-45.40
0.018-0.017	49.00-55.40	44.30-46.00
0.016-0.015	49.90-56.30	45.10-46.80
0.014	50.90	46.10-47.80
0.013-0.012	52.10	46.80
0.011	53.10	48.00
0.010-0.0095	54.60	49.40
0.009-0.0085	55.90	50.90
0.008-0.0075	57.50	52.10
0.007	59.00	53.60
0.006	60.60	55.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	42.70	47.50
5050-F	43.80	48.60
3004-F	44.80	50.50
5052-F	44.40	51.20
6061-T6	46.90	53.00
2024-T4	50.60	57.40
7075-T6*	58.40	66.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	78.20	75.20	....	....
0.156-0.172	66.20	63.40	....	....
0.188	66.20	63.40	....	81.60
0.219-0.234	63.00	61.50	....	....
0.250-0.281	63.00	61.50	....	77.90
0.313	63.00	61.50	....	74.20
0.344	62.50	....	....	....
Cold-Finished				
0.375-0.547	62.50	61.30	74.80	69.80
0.563-0.688	62.50	61.30	71.10	65.50
0.719-1.000	61.00	59.70	64.90	61.70
1.063	61.00	59.70	....	59.60
1.125-1.500	58.60	57.40	62.80	59.60
Rolled				
1.563	57.00	55.70	....	....
1.625-2.000	56.30	54.90	....	57.50
2.125-2.500	54.80	53.40	....	....
2.563-3.375	53.20	51.70	....	....

Forging Stock: Round, Class 1, random lengths: 2014-F, 46.90-53.90, diam. 1-8 in.; 6061-F, 43.50-53.90, diam. 1-6 in.; 7075-F, 63.50-73.90, diam. 1-3.875 in.; 7079-F, 68.50-78.90, diam. 1-3.875 in.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$19.40	2	$ 59.90
1	30.50	4	165.05
1¼	41.30	6	296.10
1½	49.40	8	445.55

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	60.60-64.80
12-14	45.70-47.20	61.30-65.80
15-17	45.90-47.90	62.50-67.50
18-20	46.50-48.30	64.50-70.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.80	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 13.50-14.00; old sheets, 10.50-11.00; borings and turnings, 6.50-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.73	44.91	55.44	....	15.000	14.750	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	58.18	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

7.00; crankcases, 10.50-11.00; industrial castings, 10.50-11.00.

Copper and Brass: No. 1 heavy copper and wire, 17.75-18.25; No. 2 heavy copper and wire, 15.75-16.25; light copper, 13.75-14.25; No. 1 composition red brass, 15.00-15.50; No. 1 composition turnings, 14.50-15.00; new brass clippings, 12.50-13.00; light brass, 9.00-9.50; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 11.50-12.00; cocks and faucets, 12.00-12.50; brass pipe, 12.00-12.50.

Lead: Heavy, 8.25-8.75; battery plates, 3.50-3.75; linotype and stereotype, 10.25-10.75; electrotype, 9.25-9.75; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 16.00-17.00; 3003 clippings, 16.00-17.00; 6151 clippings, 15.50-17.00; 5052 clippings, 15.50-16.50; 2014 clippings, 15.00-16.50; 2017 clippings, 15.00-16.50; 2024 clippings, 15.00-16.50; mixed clippings, 14.50-15.50; old sheets, 12.50-13.00; old cast, 12.50-13.00; clean old cable (free of steel), 15.50-16.00; borings and turnings, 13.00-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.00; light copper, 15.75; refinery brass (60% copper) per dry copper content, 17.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.00; light copper, 15.75; No. 1 composition borings, 17.00; No. 1 composition solids, 17.50; heavy yellow brass solids, 12.00; yellow brass turnings, 11.00; radiators, 13.50.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 10-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 110.50; 200-499 lb, 109.00; 500-999 lb, 108.50; 1000 lb or more, 108.00.

Zinc: Balls, 17.50; flat tops, 17.50; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 71.60; 300-900 lb, 69.60.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: Less than 400 lb, 35.00; 400-9999 lb, 33.00; 10,000 lb, 32.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.30; 100-600 lb, 65.20; 700-1900, 62.50; 2000-9900 lb, 60.60; 10,000 lb or more, 59.30.

Stannous Chloride (anhydrous): Less than 25 lb, 163.50; 25 lb, 128.50; 100 lb, 113.50; 400 lb, 111.00; 5200-19,600 lb, 98.80, 20,000 lb or more 86.60.

Stannous Sulphate: Less than 50 lb, 126.40; 50 lb, 96.40; 100-1900 lb, 94.40; 2000 lb or more, 92.40.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page* 125)

workweek schedules, foundries are buying pig iron and coke only as needed. With small backlogs, the castings shops are forced to gear their operations to the rate of new business.

One steel casting producer in the Detroit area says his regular customers are slow in ordering. The plant offers three-week delivery on standard castings and is operating at 80 per cent of its break-even level. Castings for 1959 and 1960 model cars have been held up indefinitely, reports this foundry. Some of this delay may be due to consolidation at Ford (see Page 51) which has caused a temporary delay in orders from that firm.

In the Buffalo district, merchant iron producers continue to operate at relatively high levels in view of current light demand. Stockpiling of iron continues. Some steel mills also are stocking iron because their own open hearth activities are not high enough to use all the hot metal flowing from blast furnaces.

In the Pittsburgh district, 34 of the 47 blast furnaces were active in early January. Demand for pig iron then was at least 25 per cent lower than it was a year earlier when 46 of 47 furnaces were active.

Iron Ore . . .

Iron Ore Prices, Page 120

Iron ore production in selected foreign countries in the first ten months of last year totaled 34,530,000 gross tons, reports the U. S. Bureau of Mines. Production was : Chile, 732,000 tons; Peru, 2,887,000; Venezuela, 12,273,000; Canada, 18,638,000. Monthly data are:

Foreign Iron Ore Production—1957

(Gross tons, 000 omitted)

Months	Chile	Peru	Venezuela	Canada
January	78	271	977	244
February	69	239	838	79
March	65	231	827	50
April	94	298	1,029	275
May	74	313	1,272	2,576
June	6	279	1,404	2,889
July	29	307	1,246	3,410
August	95	334	1,646	3,318
September	104	319	1,558	3,269
October	118	296	1,476	2,528
10 mo.	732	2,887	12,273	18,638
1956	1,002	2,603	10,939	19,649
1955	942	1,700	8,249	14,603
1954	1,956	2,187	5,339	6,552
1953	2,131	985	2,260	5,761
1952	2,147	....	1,939	4,707

WANTED

One—36"—48" x 216" to 240"
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For Eastern District Office recently opened in Baltimore, Maryland.

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CLASSIFIED

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Positions Wanted

SALES EXECUTIVE: For Alloy Plate Fabrication, graduate engineer with a twenty year background in production, engineering and sales management of custom built chemical process equipment primarily in the alloys. Seek new challenge in N. Y., N. J. or Pa. area. Write Box 626, STEEL, Penton Bldg., Cleveland 13, Ohio.

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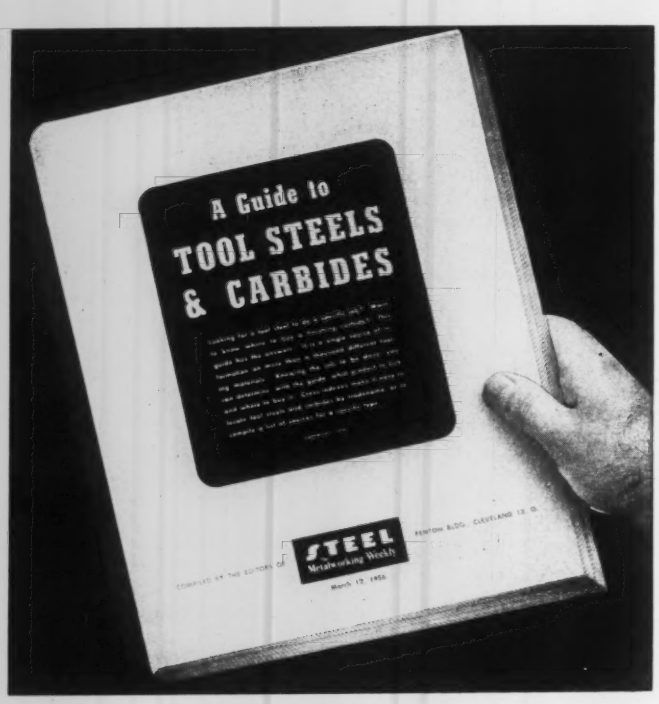

HERE'S HELP for your tooling problems

Looking for a tool steel to do a specific job? Want to know where to buy a finishing carbide? This guide has the answers. It is a single source of information on more than a thousand different tooling materials. Knowing the job to be done, you can determine, with the guide, what product to buy and where to buy it. Cross indexes make it easy to locate tool steels and carbides by tradename, or to compile a list of sources for a single type.

40 PAGES

Copies of the Guide to Tool Steels & Carbides are available from Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.. at the following prices:

1 to 10	$2.00 ea.	51 to 100	1.80 ea.
11 to 50	1.90 ea.	101 to 200	1.70 ea.
		over 200	1.60 ea.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 120

Coke production in the U. S. during November totaled 5,622,312 net tons (5,531,945 oven coke and 90,367 beehive), reports the Bureau of Mines. In October, output amounted to 6,275,567 tons (6,157,497 oven and 118,070 beehive), and in November, 1956, it was 6,538,700 tons (6,332,300 oven and 206,400 beehive).

In the first 11 months of 1957, output totaled 70,613,954 tons (68,663,678 oven and 1,950,276 beehive). This compares with 67,609,200 tons (65,372,600 oven and 2,236,600 beehive) in the like period of 1956.

Producers' stocks of oven coke at the end of November amounted to 2,963,062 net tons, equal to 16.1 days' production. At the end of the like month in 1956, stocks were 2,442,070 tons, equal to 11.6 days' output.

Warehouse . . .

Warehouse Prices, Page 119

Some distributors of sheet and bars, whose bookings dropped sharply in late December, now report moderate improvement in demand.

Warehouse sales are expected to level off in February and to remain steady through late first quarter.

Although January bookings were about 5 to 10 per cent ahead of those recorded in December, present sales are 20 to 25 per cent lower than a year ago.

Despite an estimated decline of 7.5 per cent in mill shipments to warehouses last year, distributors complain of high inventories in practically all steel product classifications. Normal buying policy of steel consumers over the last six months makes this paradoxical. Small-lot, fill-in buying should operate to the advantage of warehouses, but they are benefiting far less than might be expected. One answer: Producers are booking more small orders than usual, thereby cutting into the normal warehouse business (shipments of sheets from mills to warehouses have been off for six month). At the same time, shipment of plates and structurals from mills have increased.

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MALLEABRASIVE
MALLEABLIZED SHOT and GRIT

TRU-STEEL
HIGH CARBON STEEL SHOT

G. ALLAN MacNAMARA

Portrait by Fabian Bachrach

"IT'S AGAIN FASHIONABLE TO BE THRIFTY— and 69% of our Soo Line employees are saving regularly through the Payroll Savings Plan"

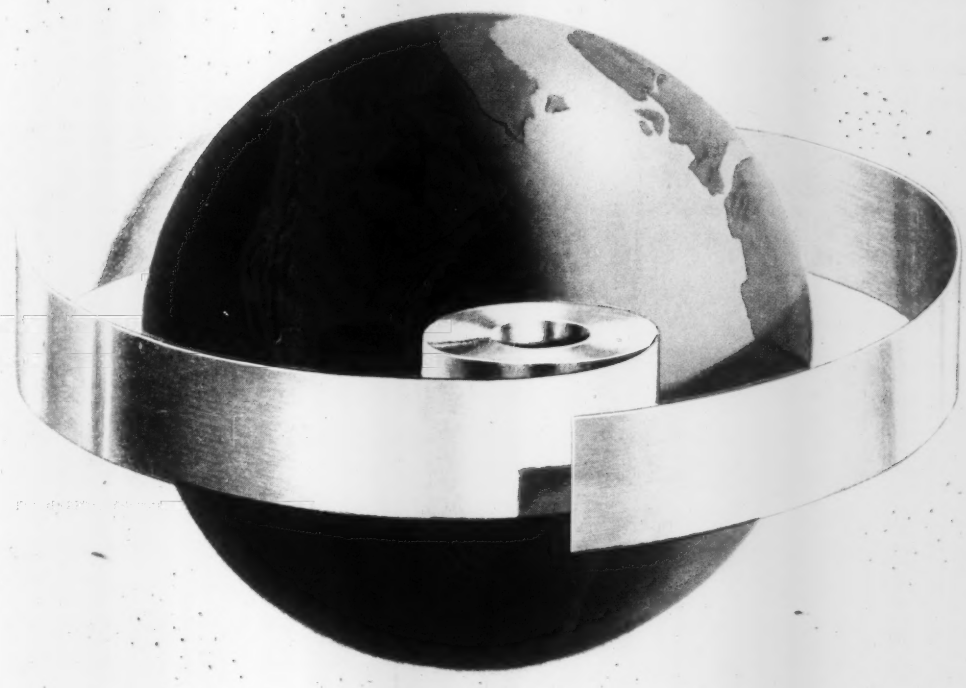
"It's again fashionable to be thrifty, and it is reassuring to note that 69% of our employees on the Soo Line are making regular purchases of U. S. Savings Bonds. Inflation is a complex thing, but here is a simple, direct step every one of us can take to help control the rising price spiral. Our recent company-wide campaign has proved that employees *want to* and *will* practice thrift by buying U. S. Savings Bonds."

G. ALLAN MacNAMARA, ***President, Soo Line Railroad***

Individual savings are the bedrock of a sound economy. Today there are more Payroll savers than ever before in peacetime. If employee participation in *your* Payroll Savings Plan is less than 50% . . . or if *your* employees do not now have the opportunity to build for their future through the systematic purchase of U. S. Savings Bonds, your State Director will welcome an opportunity to help. His experience is yours, in setting up a Payroll Savings Plan or in building up enrollment in one already existing. Look up your State Director in the phone book. Or write: Savings Bonds Division, U. S. Treasury Dept., Washington, D. C.

STEEL
The Metalworking Weekly

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR ABOVE



ALL AROUND THE WORLD . . . strip coil producers prefer Lee Wilson high convection annealing furnaces

Great Britain, Canada, Sweden, Australia, Japan, Germany, Brazil, Mexico, Chile, Belgium, Luxembourg, France, Spain—wherever steel is made—you'll find the number one annealing furnace to be Lee Wilson's efficient Single Stack High Convection unit.

The world over, steel engineers know that no other furnace can deliver the uniformity and quality, the speed and low operation cost of the versatile Single Stack.

When next you're considering annealing equipment isn't it just good business to talk first with the world's leading furnace builders—Lee Wilson's engineers?

Lee Wilson* **ENGINEERING COMPANY, INC.**

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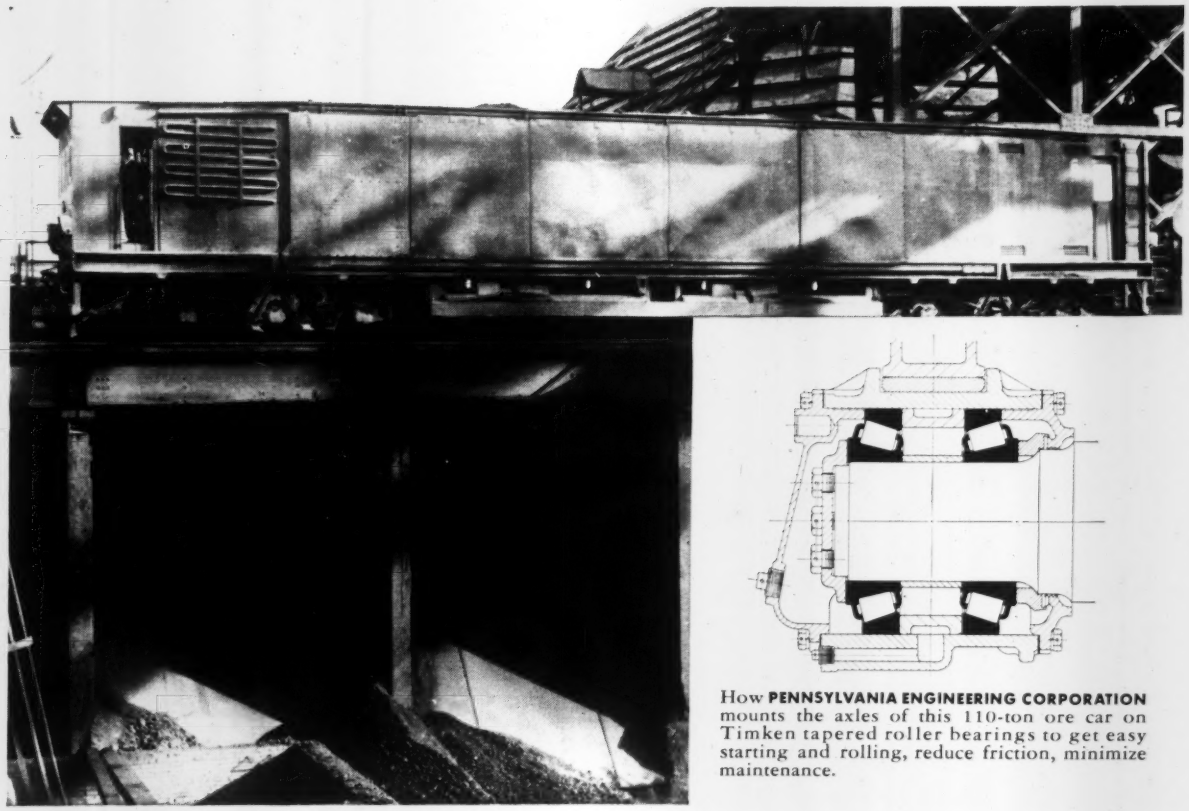
SINGLE-STACK RADIANT TUBE ANNEALING FURNACES

MAKE THE BEST METALS BETTER

* ORIGINATORS AND LEADING PRODUCERS OF SINGLE-STACK RADIANT TUBE FURNACES



How **PENNSYLVANIA ENGINEERING CORPORATION** mounts the axles of this 110-ton ore car on Timken tapered roller bearings to get easy starting and rolling, reduce friction, minimize maintenance.

New 110-ton ore car starts easier, rolls smoother and longer on Timken® bearings

BECAUSE this ore car carries a whopping 110-ton load, it has to be easy to start and keep rolling. It's a natural spot for Timken® tapered roller bearings. And it's no wonder that Pennsylvania Engineering Corporation used them on all 6 axles.

Because Timken bearings *roll* the load, starting resistance is cut up to 88%. There's no metal-to-metal sliding friction. Fully loaded cars start easier, with less power loss.

Geometrically designed and precision-made to roll true, Timken bearings virtually eliminate friction. Cars roll smoothly.

And Timken bearings take the tremendous weight and heavy shock loads. Their rollers and races are case-carburized to have hard, wear-resistant surfaces over tough, shock-resistant cores. Full line contact between rollers and races gives Timken bearings *extra* load-carrying capacity. Their taper lets Timken bearings take both radial and thrust loads in any combination. No costly extra thrust devices are needed. Bearing life is longer, maintenance is minimized.

What's more, by holding housings and shafts concentric, Timken bearings make closures more effective. Dirt and dust stay out. Lubricant stays in.

For all these advantages, specify bearings trade-marked "Timken" for the machines you buy or build. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED — *This symbol on a product means its bearings are the best*

TIMKEN

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TAPERED ROLLER BEARINGS ROLL THE LOAD